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ABSTRACT

This book aims to inform science teachers of their legal rights and responsibilities. The roles of various federal, state and local authorities in educational legislation are described. The teacher's liability for student safety and for implementing the curriculum as prescribed by state and local regulation is defined, and suggestions are made for ensuring student safety. Guidelines are given for working with the community and for accounting for funds and equipment. Help available to the teacher who finds himself in trouble is described, and suggestions are made for positive action that may be taken to modify laws and regulations. The appendix includes bibliographies on teacher liability, narcotics and alcohol education, care of living animals, radiation safety, eye protection, sex education, model rocketry, and general health and safety. Sample policy statements and safety regulations are included. (EB)

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SCIENCE TEACHING and the LAW

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Foreword

INTERWOVEN IN society's expectations for education in science are pushes, pulls, and cautions regarding curriculum, techniques of teaching, and the situations in which students learn science. These forces are expressed in statutes and regulations, in the activities of pressure groups, and in the legal responsibility imposed on teachers for the well-being of the students in their charge. Teachers may be unaware of these regulations, only partially informed, or unduly fearful of their strictures.

This publication is designed to outline the situation of the science teacher in relation to the laws and regulations that impinge on his professional activities, to alert him to the wide range of these regulations, and to suggest ways in which the teacher himself can take positive action to assure control but not hindrance, responsibility but not fear.

It is hoped that science teachers, supervisors, and administrators—in each school district—in fact in each school and in each teacher education institution—will make use of this book as a handbook, will add to it the specific regulations in effect in their own communities, will obtain the pertinent materials listed in the Appendix, and will themselves become a creative force in the formulation of their own guidelines.

Robert H. Carleton
Executive Secretary
National Science Teachers Association

SCIENCE TEACHING AND THE LAW

PREFACE: *The Purpose of This Book*

WHEN WORK on this book began, the National Science Teachers Association sent a questionnaire to a selected portion of its membership and to some of the agencies and associations known to be especially concerned with the legal aspects of science teaching. As a result of this survey, many helpful suggestions were received. Most of these have been incorporated into this publication.

A not inconsiderable number of the respondents offered a hint of caution concerning the project, however. This group seemed to agree that a book dealing with the legal responsibilities of teaching science might possibly frighten some teachers, making them less effective. We have tried to avoid writing a manuscript that might "cry wolf." The purpose of this book is to show the science teacher how laws that pertain to his profession came into being, how they affect his teaching, and to explain his legal rights and responsibilities.

Such a goal is not totally achievable. Any book about the law as it pertains to the entire country cannot be all-inclusive, partly because there are 50 states with 50 sets of statutes and regulations. Further, the legislative bodies of each of these 50 states are constantly modifying their statutes and regulations, repealing some and adding others. And finally, the courts, whose main job is to interpret the written laws (statutes) and the written and unwritten regulations, are continually handing down new decisions. To further complicate matters, perhaps now more often than at any time in the past, the decisions of the courts may not follow precedents very closely, making it difficult to predict how a specific law will be interpreted in a specific case.

On the other hand, there are many basic principles of law which will, we hope, guide the science teacher in his attempt to discharge his duties within the law. There are also many techniques the science teacher can employ that will enable him to teach his students effectively and at the same time ensure their safety. Being well informed can help a teacher to obey the laws of his state and to avoid the criticism of various special-interest groups.

In addition to informing the science teacher of his legal rights and responsibilities, it is hoped that this book will encourage him to participate actively and conscientiously in revamping outmoded laws and in helping to lay the foundation for needed new legislation.

It has been said that the law "is not a jigsaw puzzle with a foreordained solution; it is rather a complex admixture of precedent, justice, philosophy, and interpretation."[1] We hope this book will help the science teacher to understand this philosophy and to build upon it, and hope it will also help those responsible for school administration to foresee useful inservice activities.

Billye W. Brown
Walter R. Brown

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CHAPTER 1

Laws Concerning Education

HAVE YOU, as a teacher, ever wondered, "Just what is the extent of my legal responsibility to and for my students and for curriculum choices?" Or, to approach the subject from a different direction, "What are the *limits* of my responsibilities? What prescriptions are already laid down for me as to what I must teach or not teach?" If you send one of your students on an errand, are you responsible if he is injured? Suppose a student causes damage to other people's property while on an errand for you. What precautions must a teacher take so that he will not be held legally responsible for an accidental injury to students working in his school laboratory? How do you stand with regard to your students' safety on a field trip, or with regard to the safekeeping of others' property while on a field trip? What are the local regulations regarding the giving of first aid? Are there regulations that call for wearing safety glasses in your laboratory? Does your state have requirements concerning the storage of certain chemicals? How much bookkeeping is required of you with regard to state or federally owned property? Are there topics that you are required by law to teach? Must you spend a specified length of time on these topics? Is there anything about which you may not teach?

Each of these questions has an answer or an explanation. But before we get into specific cases, let's take a look at the basis for laws that pertain to science teaching.

The word *law*, as a glance at an unabridged dictionary will reveal, may be defined in several contexts. However, in this book we will use it to refer to the various rules and regulations that concern the science teacher as he pursues his vocation.

The word law, as we will use it, can refer to the provisions of the federal constitution and the constitutions of the 50 states. It will also include the statutes enacted by the Congress of the United States and by the legislatures of the states.

In addition, there are those regulations that pertain to the teaching of science that are not statutes, but that exist instead in the form of interpretations of written laws. In many cases, interpretations are made of ideas that are not written but that have come to be accepted as valid parts of "common law." These interpretations may be in the form of decisions handed down by various courts of the country. In cases such as these, the interpretations pertain only to the specific cases being tried, and the reasoning of the judges must be extrapolated in order for them to be applied to similar cases. The regulations that apply most directly to the science teacher, however, are those stated by various government officers and school administrators, based on their interpretation of either federal or state statutes.

Federal Authority

The authority of the central government comes directly from the Constitution of the United States. That is to say, all regulations of our federal government must be based directly upon the written document that was signed in 1787 and upon the 22 amendments to it. This document and its amendments must be the basis for all laws passed by Congress and signed by the President, and for all regulations coming from the various federal government officers.

Our federal constitution makes no mention of education. Because of this, the courts have held that education is a function of the various states and not one of the federal government. These decisions are based upon the 10th Amendment to the Constitution which says, "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people." Thus, the states may do anything not prohibited by the constitution.

We all know of instances where the federal government does influence or exert a certain amount of authority over education in all of the states. Some of this power arises from the so-called "general welfare clause" of Article 1, Section 8 of the Constitution. This clause gives Congress the authority "... to lay and collect taxes, duties, imposts and excises, to pay the debts and provide for the common defense and general welfare of the United States; ..." The National Defense Education Act (NDEA) of 1965 carries its rather peculiar title in order to qualify its regulations under the "defense" portion of the general welfare clause.

The courts have held that the Congress may not use the taxing and spending powers given it under Article 1, Section 8 to regulate or control an activity reserved to the state[2]—a decision that apparently includes education. However, the fact that the Social Security Act was upheld by the Supreme Court would seem to allow Congress to use public money to urge the states to undertake programs of importance to the nation's welfare.[3]

Since around the turn of the present century, the courts have more or less consistently ruled that the 14th Amendment to the Constitution caused the first ten amendments to apply to the states. Until this time, the restrictions of the amendments were held to apply only to federal power, with the exception of the "equal protection of the laws" clause of the 14th Amendment which was directed specifically at the states. This amendment and the rulings interpreting it have opened the door to allow the Federal Government to exert more influence over educational problems. These rulings have also defined somewhat more clearly the limits of power that the states have over their educational systems.

State Authority

The courts seem to have agreed consistently that the establishment and maintenance of a system of schools is an obligation of the state[4] and is not a local function at all.[5] The authority for establishing a public school system comes from the state's obligation to provide for the general welfare of its citizens. It has been said that "the schools exist as a state institution because the very existence of civil society demands it."[6] It would seem, therefore, that schools are provided not for the benefit of their pupils, but for the good of society.[7]

In order to achieve this, each state has established a school system and has provided a set of statutes under which this school system is to function. The responsibility for the administration of the school system is, generally, delegated to local groups of people, i.e., boards of education, who are then considered to be public officials of the state.

The absolute power of the state over the local education program, however, is limited by the provisions of the federal constitution. For the most part, these limitations are imposed by the "equal protection" clause of the 14th Amendment, and the courts' interpretation that the provisions of this amendment cause the "freedom of religion" clause of the 1st Amendment and the "due process of law" clause of the 5th Amendment to be applicable to the states. Just how far these provisions of the Constitution go in limiting state control of their schools, however, has not been finally established. Each year dozens of cases are tried for the purpose of probing these restrictions.

That the state does not have complete control over the curriculum of its schools was indicated by the ruling of the U.S. Supreme Court in 1967 that declared unconstitutional a 1928 Arkansas law prohibiting the teaching of evolution to public school students.[8] The court ruled that the law conflicted with the 1st Amendment, which deals with the freedom of religion. The 14th Amendment had been upheld in 1923 in the decision that a Nebraska law prohibiting the teaching of German was unconstitutional. The teacher's "right thus to teach and the right of parents to engage him so to instruct their children, we think, are within the liberty of the amendment," the court stated.[9]

The efforts of some states to prohibit parochial and private schools from operating have also been ruled as unconstitutional, on the grounds that such a prohibition deprives the schools of their rights without due process of law and deprives the parents of their rights to send their children to religiously oriented schools. The state can, however, restrict the establishment of a school that may threaten the public welfare. In addition, the state may exercise some control over the quality of education in nonpublic schools.

The 14th Amendment has also been interpreted as allowing the states to spend public money to provide certain services for the pupils of private and parochial schools, if the services are given directly to the students and not to the schools. This interpretation is known as the "child benefit" theory, and was first applied to a case in which the State of Louisiana provided free textbooks for all school children in the state. The U.S. Supreme Court ruled that this was not in violation of the 14th Amendment, since the books were given directly to the pupils and not to the schools.[10] More recently, the "child benefit" theory has been applied to the busing of students to private and parochial schools at public expense. How far this theory can be carried is yet to be determined by judicial decision.

The problem of religion in the public schools has also been dealt with by the courts, through the 1st Amendment, which says that "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; . . ." The original intent of this clause was to restrict the powers of Congress and not the states. However, according to recent opinions of the Supreme Court, the 14th Amendment makes this prohibition apply to the states as well. Because of this interpretation, guidelines have been established for programs of released time from public schools for religious education.[11, 12]

The most common recent application of the restrictions of the 14th Amendment has been in cases dealing with the segregation of pupils on the basis of race.

Delegated Authority

With this basis for school law in mind, we come to the fact that the portions of the law that most often directly affect the classroom science teacher are neither the written legislation of his state nor the written constitution of the United States. These laws are, of necessity, written in very general terms. The regulations that most directly concern the science teacher and which provide the major portion of the restrictions under which he works, are those interpretations and judgments made by various officers of his state.

It is the legislature of a state that has the final authority over the schools of that state subject, as we have seen, to the restrictions of the federal constitution. It is, however, impossible for the legislature to directly administer the schools for which it is responsible. Therefore, the legislature, through statutes, delegates its *administrative* authority to various groups who supervise the educational activities of the state. This authority is generally delegated to groups at both the state and the local levels—for example, the state board of education and the various local (county, city, and/or district) boards of education.

Through the statutes dealing with school laws, the legislature of a state attempts to define the limits of the authority of these administrative groups. The courts have been unable to define these limits except to indicate that a legislature may delegate only its administrative responsibility and not its legislative authority.[13]

Working within guidelines established by the legislature and within the framework of the federal constitution, these administrative officers are empowered to make certain types of regulations concerning the schools. These local and state regulations, which are in fact *interpretations* of statutes made by public officers, make up the major legal framework within which the classroom science teacher must work. Where these regulations have been found to be reasonable as well as constitutional, the courts have held that they are legal requirements and must be met by the employees of a school system.

CHAPTER 2

Teacher Liability

IF *YOU ARE* employed by a school system and charged with the responsibility of teaching science to a group of children, your position requires that you establish an environment in which these children will be able to have certain experiences. It will be your duty to help them learn certain portions of the subject matter of science and to help them develop certain attitudes and skills. Whether your assignment is that of a primary teacher in a self-contained classroom or of a science teacher in a secondary school or a college, the students with whom you work are sometimes exposed to potentially dangerous situations.

The National Safety Council estimates that during any typical school year, over 800,000 accidental injuries occur to students while under the supervision of the elementary and secondary schools of the United States. Of these, over 5,000 accidents happen in science laboratories, and a few in science classrooms and during science field trips.[14] With these figures in mind, you may well wonder to what extent the classroom science teacher is liable for the injuries suffered by his pupils.

Who Is Legally Responsible?

If a child is injured while at school or while he is on school business, you might assume he could sue the school district for damages. However, it is a principle of common law in most states that a school district, being a subdivision of the state government, cannot be held liable for injury to its pupils. There are a few states that have passed laws that reverse this idea, allowing students to recover damages from the district directly. Some of these are Minnesota, Wisconsin, California, New York, Washington, Illinois, and to a limited degree North Carolina and New Jersey. But in most cases, if there are grounds for a suit, these may be proved against the teacher and not the school district.

Many states have recently passed legislation that, in some measure, protects the teacher from liability suits. As a general pattern these laws, called "save harmless" statutes, authorize the local school board to protect teachers from financial loss arising out of negligence suits. Usually this protection is afforded only if the injury was suffered while the teacher was acting within the scope of his employment. These "save harmless" laws do not prohibit the filing of a suit against a teacher.

Some professional teachers' organizations at the state level carry liability insurance, covering all of their members. It is possible, of course, for a teacher to purchase his own liability insurance policy, if he wishes.

It has been ruled that the teacher is not the "servant" or "agent" of the school district, in the legal sense of those terms.[15] Therefore, unless the employer actively participates in a negligent act or approves of it, it is unlikely that a court will transfer the responsibility for injury from the teacher to his employer.

All of this may sound pessimistic from the teacher's point of view, but actually it is not. The fact that a student is accidentally injured while in the teacher's care does not automatically make the teacher responsible or liable for damages.

In 1954, the Supreme Court of Wisconsin decided a case in which a teacher was charged with negligence because he had left an unlabeled jar of acid on a storeroom shelf. The jar, similar to a quart mayonnaise jar, was placed on a high, firmly fixed shelf by the teacher in the presence of several students. Later, when two boys went into the storeroom in order to clean its floor, the teacher reminded them that the acid was there. Apparently the students began to scuffle; one bumped the shelf, the acid fell, and the boy was badly burned.

The court ruled that the teacher in this case was not negligent, since he had placed the acid on a stable spot and had warned the boys of its presence. It was also held that the actions of the injured boy, who was almost 16 years old, and not the actions of the teacher, were the cause of the injury.[16]

Reasonable Care

In the eyes of the law, a teacher is considered to stand in the place of the parent *(in loco parentis)* in his dealings with his students. Like everyone else, he must also comply with the general common-law obligation of not causing injury to others through neglect. Therefore, it must be proved that the teacher has acted in an illegal or improper manner or has neglected to take proper action before he can be held personally liable for any injuries to his students. A Michigan court has said, "In the faithful discharge of such duties the teacher is bound to use reasonable care, tested in the light of the existing relationship. If through negligence, the teacher is guilty of a breach of such duty and in consequence thereof a pupil suffers injury, liability results." [17]

A Circuit Court of Appeals decision of 1941 illustrates what may be meant by the terms "negligent" and "reasonable care." Three college freshman women, enrolled in their second semester of chemistry, contacted their instructor about making up a missed laboratory session. The teacher took them to a laboratory where an advanced group of students was working, and found them an empty table.

Their assignment consisted of two exercises, one concerned with the preparation of oxygen and the second with some of the properties of the gas. The teacher worked with the girls on the first experiment, which was described carefully in writing. Included in this write-up was a caution concerning the danger of mixing chlorates with other substances.

As the girls finished the first exercise, the teacher instructed them to gather the materials needed for the second experiment. He later testified that his instructions were to gather the materials, set up the apparatus, and wait for his return. None of the girls could remember these instructions being given.

They obtained the needed materials, which included red phosphorus, potassium chlorate, and ferric oxide, from the stock room. After some debate among themselves about how to proceed, they mixed the compounds and applied heat from a

Bunsen burner. A violent explosion occurred, injuring all three students.

The plaintiffs introduced the testimony of chemistry teachers employed by other schools in the area. They testified that they would always insist that students let them approve the equipment setup before doing the experiment, and that they would never leave a laboratory unsupervised. As a result, the court decided the teacher had not exercised the care that he should have, and held him responsible for the girls' injuries.[18]

In general, "reasonable care" may take two forms. A teacher must not do anything that a reasonable person would recognize as being potentially dangerous. Neither may he fail to do something that would be necessary to protect the safety of his students. Thus, negligent conduct may take two forms—the performance of an act that puts pupils in danger, or the failure to take an action to protect them.

The Test of Foreseeability

The principle of law that is generally applied in order to determine the extent of liability and the one that adds the most uncertainty to the discussion of teacher responsibility is the test of *foreseeability*. The law requires that the teacher foresee the danger in a situation only to the same degree that any "reasonably prudent" person would. It is almost impossible to arrive at a tight definition of reasonably prudent, however. The court usually has to decide each case on its own merits.

For example, a Michigan teacher asked a student to water some plants in an adjoining greenhouse. The girl, carrying a glass bottle full of water, tried to climb upon a chair in order to reach the plants. The chair collapsed and the student fell onto the broken bottle. In its 1937 decision, the court held that the teacher could not have forseen that the situation was dangerous.[19]

As another example, a wrestling instructor was declared not liable for the injury suffered by one of his students during a match, when the court decided that it was not possible for the teacher to foresee the possibility of the injury.[20]

On the other hand, a 1959 decision held that the school personnel should have foreseen the danger in letting small children play in a room that contained an ancient upright piano.

Several nine-year olds attempted to move the piano, which was on casters, in order to get to the keyboard. During the process, the piano toppled over, badly injuring one of the children.[21]

Not only must the teacher give proper supervision to his students in order to demonstrate that he has taken reasonable care to ensure their safety, but he must also exercise reasonable care in the assignment of tasks to them. In a science laboratory, students must be given specific instructions regarding the safe use of the equipment and supplies.

A 1935 case held that the teacher was liable for injuries suffered by a student in a chemistry laboratory explosion in spite of the fact that the student did not follow the directions that had been supplied to him in writing. The students were making gunpowder as a part of their course requirement. The textbook indicated which chemicals were to be used in the experiment, and gave well-defined directions for combining them. The student, who had successfully performed this experiment twice before, did not follow these directions carefully. Reaching to the shelf in front of him, he selected a bottle of potassium chlorate instead of potassium nitrate, as called for in the directions. Then, he proceeded to pulverize the ingredients all together in a single mortar, rather than separately as directed. During the mixing process, the gunpowder exploded, blowing off the student's left hand and blinding him almost entirely.

The court emphasized that it was the teacher's responsibility to supervise the selection and use of chemicals. This judgment also indicated that safety instructions must be given *for each specific experiment*, rather than rely upon general instructions given at an earlier time.[22]

Field Trips

The same rules of "reasonable and prudent" action apply to the responsibilities of the science teacher who is conducting a field trip away from school. Through adequate supervision and sufficient planning with his pupils, the teacher can ensure that he has discharged his responsibilities.

If a pupil is injured while on a field trip, the teacher may find it possible to prove that reasonable care was taken if he can demonstrate that he visited the site prior to the trip in order to determine in advance what dangers might be involved and that he warned his students of these dangers beforehand. He may also find it useful to be able to show that he established rules for safe conduct with his pupils before taking the trip.

Since a parent cannot sign away the child's right to sue a negligent teacher, some teachers and administrators no longer obtain written permission from the parent before taking a child on a field trip. However, such a signed slip might be evidence that the teacher had planned the trip carefully in advance. It would also indicate that the parent knows of the activity and has indicated a willingness for his child to participate in it. In any case, suits are rarely brought against the teacher as a result of an injury to a student while on a field trip. Instead, the pattern seems to be that the suit is brought against the institution being visited.

Errands

It is common practice for teachers to send students on errands for them—across the street to the drugstore for a sandwich or across town to the hardware store for science supplies. It would seem likely that if the student were to be injured while following such directions, the teacher would be held liable. In addition, it is possible that the student would be considered to be an *agent* of the teacher and the liability for any damage caused by the student would also fall on the shoulders of the teacher. Thus it seems that the best way for a teacher to avoid this kind of trouble is to refrain from sending students on errands away from school.

Discipline

It is fortunate that, once given certain responsibility for the education of his students, the teacher has also been given the power to allow him to perform his duties. He may, within reason, control the behavior of his students [23] and may punish pupils for the violation of rules as he sees fit, so long as this punishment is within the statutes of the state and is both humane and reasonable. One court has held that the punishment must be for a specific violation and that the student must know the offense for which he is being punished.[24] In addition, the punishment must be commensurate with the offense and may not be excessive.[25]

This authority to control the actions of the student comes from the state, not from the parents and is limited by state statute and by the regulations of local administrators.

The limits of this authority, however, are not often clear-cut. The statutes of many states allow corporal punishment by the teacher and/or the principal of the school. Occasionally a teacher is charged with assault and battery as a result of the administration of corporal punishment to a student. In these cases, the court generally will attempt to assess the degree of "reasonableness" and "humaneness" of the punishment. If corporal punishment is not administered maliciously and the child is not permanently injured, the teacher is usually not found liable.[26]

Perhaps the most common form of punishment used by teachers is to keep a child at school after the regular dismissal time. It is possible that the teacher might be charged with false imprisonment in such cases. However, if the punishment is found not to be excessive or unreasonable, the court will usually rule against such a complaint. However, the use of physical force to keep the child from leaving the school has been found to be excessive.[27] Gauerke, in *Legal and Ethical Responsibilities of School Personnel,* observes, "If for a 'reasonable' time and for a 'reasonable' purpose, such detainment is considered to be for the best interests of the child or for the general welfare of the school. The right of the teacher to the child's time supersedes that of the parent in this particular regard." [28]

Transporting Pupils in Personal Cars

Occasionally a teacher finds it necessary or desirable to transport students in his personal car. If an accident occurs and the passengers are injured, the teacher may be held liable. Since this is the usual situation with any passenger in a private automobile, it is mentioned here only because of the few states that have statutes to the contrary. For example, Delaware has a law that is intended to protect an automobile owner from suit for damages by a passenger riding as a guest of the owner. That is, if the passenger is being transported for his own benefit and the owner of the automobile does not derive any profit himself, the owner is protected against suit.

In one case, however, a teacher was held liable for injuries suffered by a student who was being transported in the teacher's car from his home to the hospital, even though this was after school hours and at the request of the parent. The judgment was based on the logic that, while the teacher was acting partly out of humanitarian reasons, he was also performing a duty as a teacher since the injured party was one of his students.[29]

Neglect of Duty

Some negligent actions on the part of teachers do not result in injury to others. In general, the teacher who is negligent in his assigned duties is liable to the school district for any loss that he causes.[30, 31] Some states have statutes that call for fines and other types of punishment to be assessed against a teacher who neglects his duty.

Summary

In all states it is the teacher, himself, who is legally responsible for the safety of his pupils. However, the courts have held that a teacher is liable for damages only if it can be proven that the teacher has failed to take "reasonable care" or has acted in an illegal manner. A teacher must foresee dangers, but only to the extent that any reasonably prudent person would. He may punish a child, within the legal limits set by his state, as long as the punishment is humane, is not excessive, and provided the pupil knows why he is being punished. In addition, a teacher must perform his assigned duties if he is to avoid being censured by the school district in which he is employed.

CHAPTER 3

The Science Curriculum

ONCE YOU accept a job in a school system, you are legally obligated to teach the curriculum as it is prescribed by state and local regulations. In order to teach this curriculum, you must know what the school law requires and you must know the limits placed upon you by other regulations.

Some laws that seemingly have nothing to do with science teaching may affect you. If your community has an ordinance against fireworks, you may not be allowed to launch a model rocket. Your community may have a specific regulation against experimenting with model rockets, either at school or away from the school.

Who Sets the Curriculum?

As we have seen in Chapter One, the establishment and maintenance of a school system are the responsibility of the state. The courts have consistently held that, in light of the philosophy that schools are maintained for the good of the state, the state has the power to prescribe and control the curriculum of the schools. This power is total and complete, so long as it is within the limits of the federal constitution.[32]

It is not surprising, therefore, that we find that the laws of every state contain statutes pertaining to the curriculum of the schools. We will see how, in some cases, these laws are very specific and restrictive. In other instances they are general, and it is left to the administrative discretion of the local boards of education as to what is actually to be taught in the classroom.

It should be mentioned here that the regulations of the local boards carry the same weight as do those of a state legislature, since the local boards are acting as administrators for the state. The Supreme Court of Indiana has said,

> Essentially and intrinsically the schools in which are educated and trained the children who are to become the rulers of the Commonwealth are matters of State, and not of local jurisdiction. In such matters, the State is the unit, and the Legislature the source of power. . . . It is for the law-making power to determine whether the authority shall be exercised by a state board of education, or distributed to county, township, or city organizations throughout the State. . . .[33]

Occasionally these laws have been challenged in court. But since few of these cases are based upon a suspected violation of the federal constitution, it is rare that one reaches a court above the state level. The consensus of the decisions of these court cases has been that, "The state has the power to require that certain studies plainly essential to good citizenship be taught and that nothing be taught which is manifestly inimical to the public welfare." [34]

"Traditional" Science Courses

The school laws of almost every state include a list of courses that are required to be taught in the schools of the state. Science, in some form or another, is included in each of these lists. In some states, such as Ohio, the reference is only to "natural science." Others may specify courses such as biology, physics, and chemistry. One (Maine) requires the teaching of "the natural sciences in their application to mechanics, manufactures, and agriculture." [35] Laws such as these form the basis for what have come to be considered the "traditional science offerings" of the secondary curriculum.

It seems to be a general pattern that the state board of education, through the state superintendent, requires that *specific* courses be taught for a specified length of time and that these courses be satisfactorily completed by each student before he is graduated from high school. Few state laws are as specific as those of North Dakota, which require that, "All unit courses shall be taught a minimum of forty minutes a day for at least 175 days, except that all natural science courses shall exceed forty minutes to such an extent as may be determined by the superintendent of public instruction." [36] Usually, such detail is left up to the state board of education or the local school board.

In addition to these traditional courses in science, almost all state laws contain further references to topics that must be included in the curriculum. The science teacher should be aware of the fact that even though the statutes may not specify when and where these topics will be included in the curriculum, their inclusion is still required. Further, the teacher should remember that the directions of the state board of education or of the local board of education as to what shall constitute the curriculum are as binding as a written statute.

Health and Hygiene

Perhaps the science topics most commonly mentioned in various state school laws are those concerned with health, hygiene, human physiology, sanitation, first aid, and related areas of study. These topics are sometimes taught by the physical education department. Quite often these laws are associated with others requiring the teaching of the effects of alcohol, tobacco, and narcotics.

Some of these laws can be fairly specific. For example, many include the requirement that the teacher must teach *all* students about the nature, causes, and prevention of specific diseases, with tuberculosis seeming to be the most common of these. Other similar laws make the general requirement that "dangerous communicable diseases" must be a topic of instruction. In at least one state (Michigan), the legislature has thought it necessary to require that this instruction be accomplished through the use of a textbook which, ". . . is to be supplemented by oral and blackboard instruction." [37]

It is probable that the requirements of the state laws and of the state boards of education concerning the teaching of health, hygiene, and other related topics will be adequately taken care of by the traditional course in biology or by the course in health and physical education that is generally required by high schools. In a few cases, however, this would not seem to be the case. For example, the laws of one state (Utah) specify that, ". . . *beginning* with the eighth grade, a course of instruction upon the subject of sanitation and the cause and prevention of disease [shall be taught]." [38] The science teacher should be sure that the content of his course is within the requirements of his state. He should also be aware of impending changes in such requirements to meet current needs, such as a drug abuse education program.

Alcohol and Tobacco

In conjunction with laws concerning the teaching of health, we find that most states have requirements concerning alcohol and/or tobacco. Some of these laws require simply that these topics be included in the curriculum. Others specify that the "effects" of alcohol (and tobacco) be taught, while still others require that "the evil effects" be taught.

To complicate these rather vague laws still further, some statutes specify that this instruction shall be given "regularly" and in specific grades of "all schools." Others require that textbooks shall be used in this instruction. One state (Kentucky) requires that each school must present two 30-minute assemblies that deal with these topics each semester.[39]

An inspection of the biology textbooks on the market indicates that most so-called "modern" biology texts do not meet the requirements of many states, especially with regard to instruction in the effects of tobacco on the human body. Many of the states that have the more rigid and inclusive laws concerning alcohol or tobacco have prepared materials that are available for use by the science teacher. The local Heart Association and the American Cancer Society may also have materials that can be used in the schools. The teacher should be aware of the resources that are available to him.

Narcotics Education

Laws requiring that children be taught the harmful effects of narcotics have been on the books of most states for many years.

Usually, these older narcotics education requirements are included within the paragraphs dealing with the teaching of health, human physiology, alcohol, tobacco, and disease.

Until recently, these vague laws could easily be met through the traditional instruction in health and biology courses. During the last few years, however, with the increased misuse of drugs by schoolchildren, some of these laws have been strengthened. At the same time, much of the information that was formerly included in the biology and general science textbooks has been dropped. We believe that most of these texts no longer adequately provide the teacher with the resources he needs to meet the requirements of the law (or more importantly the needs of his students).

The present problem would seem to call for expanded emphasis on the effects of the misuse of drugs. Older texts dealt briefly with such drugs as opium, morphine, heroin, and codeine. But the availability and increased use of the synthetic analgesics, barbiturates, marijuana, amphetamines, cocaine, the hallucinogens, and even of glue have made the problems and the need for more education on this topic much greater than it ever was. Arrests for drug addiction and use have doubled in the past ten years, with an increasing number of students among those arrested.

The state departments of education of several states have become aware of the shortage of adequate materials for use by their teachers and are now producing excellent publications, as are many health agencies. Under a grant from the National Institute of Mental Health, the American Association for Health, Physical Education, and Recreation and the National Science Teachers Association conducted a project aimed at helping educators plan strategies for combatting indiscriminate use of drugs among young people. In late 1969 a publication resulting from the project will be available which will provide resource material and references in this area.

A bill has recently been proposed to the House of Representatives which if passed would provide money to elementary and secondary school systems to develop programs in drug abuse education. With the help of these and other programs the teachers will be more able to carry out effectively the requirements of the state laws on narcotics education.

Safety Education

Another of the more common curriculum requirements to be found in the laws of the various states concerns the teaching of safety. Fire prevention is often mentioned in these regulations.

As is the case with statutes dealing with health, the safety education laws are usually nonspecific, merely requiring that the topic be taught. In some cases, however, such safety problems as automobile accidents, fire prevention, and safe laboratory practices are specified in greater detail. Rhode Island, for example, requires that, "Each teacher shall devote not less than one hour each month to [teaching about] fire prevention." [40]

The traditional science curriculum and that of other subjects within the school program will usually meet these requirements. However, when there is a requirement such as the one mentioned above from Rhode Island or the Wyoming law which states that each teacher shall spend "not less than sixty minutes per month" in teaching about the prevention of accidents,[41] the teacher will need to accommodate his course accordingly. The science teacher should be aware of the regulations of his state and teach safety education at least to the extent required by law. It probably doesn't need to be said that these laws set *minimum* standards for teaching about safety and that in most cases these minimums should be exceeded. The far-seeing teacher will teach safety for out-of-school situations as well as laboratory safety.

Nature Study and Conservation

Nature study, the conservation of natural resources, and related topics, have long been included in the school laws of several states. With the recent national emphasis upon conservation, those states whose legislatures have neglected the subject in the past are now enacting statutes. Unlike the topics such as health and safety which can be easily included in other courses, some states require that nature study and conservation be included in the science offerings. NSTA's issues committee in 1968 prepared a statement on the conservation of natural resources for science teaching purposes. The policy of NSTA is that "such educational resources be guarded and preserved jealously." [42]

Where these laws are not specific, it would seem that any course in biology or general science would satisfy them. Some statutes, however, specify that the conservation of soil, water, forests, minerals, oil, gas, and all forms of wild life must be included in the instruction. Some require that textbooks be used, and still others specify that this instruction shall consist of a specified number of lessons of a specific number of minutes per week.

Similar laws pertaining to the teaching of the humane treatment of animals also exist. Some of these regulate the dissection of animals and will be discussed more fully in Chapter Five.

As with some of the other topics mentioned in this chapter, it would seem that the use of many textbooks currently available would not meet the requirements for nature study and conservation. In addition, it is difficult to find specific materials that have been produced by state departments of education to help the teacher meet these requirements. However, such materials are available from other sources, and the alert teacher will make use of some of them in his courses.

Sex Education

It is a fairly modern regulation that includes sex education in the curriculum, and many school systems still do not consider this an appropriate subject for the public schools to teach. In fact, until recently, the most that was said was usually a prohibition of teaching the subject without express approval of the school board.[43]

In some localities parents have put pressure, through local parent-teacher associations, on the local boards of education to have sex education included in the curriculum. State boards of education of several states have also become interested in including this topic in the curriculum of the schools under their direction. In most cases, these boards have simply produced materials that are intended to help the local school district establish a sex education program if it so desires. Many of these materials are excellent, but they are available in only a few states.

Some state boards of education have taken a stronger stand and have *required* that sex education become a part of the offerings of all public schools. The science teacher is reminded that the requirements of his state board of education may carry the same status as do statutes passed by the legislature.

In at least one state (Maryland) the board requirement has been rather specific in its definition of "sex education," differentiating it from "sex instruction." Where sex education is defined as consisting of instruction in ". . . the physical, mental, emotional, social, economic, and physiological phases of human relations . . .",[44] it would seem that the science teacher will have to go well beyond his textbook if he finds he has responsibility for this program. NSTA's issues committee urges not only teaching of the biological aspects of human reproduction, but also consideration of the whole range of human sexuality—a force which affects the attitudes and actions of individuals, families, communities, and nations.

The list of references at the back of this book includes material on sex education, as well as many of the topics mentioned in this chapter.

Observance of Special Days

A minor problem in the life of the science teacher is the requirement that his students hold special ceremonies in observance of specially designated days. Some of these that seem to have special relevance for the science curriculum are Bird Day, Arbor Day, and the like. The science teacher needs to know which days are associated with his subject-matter areas so that he can make adequate preparation for them. He can also use them as an opportunity for some real ecological or environmental message to the students and the community.

The Metric System

The possibility of adoption of the metric system as the official system of weights and measures and the investigations relating thereto are of particular importance to educational programs in the field of science, where the metric system is widely in use. People will look to science teachers for leadership in education about the metric system. The issues committee of NSTA says that United States' conversion to the metric system appears necessary and inevitable, and urges that the metric system and its language be incorporated as an integral part of the education of children at all levels of their schooling. In July 1968 Congress authorized a study of the advantages and disadvantages of converting to the metric system. At least one state (Utah) has a statute that requires the teaching of the metric system in the public schools.[45] No doubt more and more legislative assemblies will write such statutes in the near future. While it would seem likely that the traditional secondary level science courses would include such instruction, the science program of the elementary schools might not deal with this topic sufficiently to satisfy the requirement without a special effort on the part of the teacher.

Evolution

As we have seen, it is within the power of the state to require ". . . that studies plainly essential to good citizenship be taught . . ." These requirements have rarely been challenged in court, and where they have, they have almost always been upheld.

However, when legislators attempt to apply the last half of this quote, ". . . that nothing be taught which is manifestly inimical to the public welfare . . .", they sometimes run into organized opposition which disagrees with them as to what is inimical to the public welfare. The federal courts have upheld the right of a state to forbid the teaching of the violent overthrow of the government,[46] for example, but have ruled that a state cannot prohibit the teaching of German.[47]

During the religious fervor of the early 1920's, twenty states passed laws that made it illegal to teach about evolution. In 1927, the Supreme Court of Tennessee upheld the constitutionality of its law, as a result of the famous Scopes trial, then reversed the decision on other grounds, and the case was never decided in the U.S. Supreme Court. (In 1967 the law was quietly repealed following legal action brought by a teacher who had allegedly violated the law and had been dismissed from his position.)

By 1968 only Mississippi and Arkansas still had their anti-evolution statutes. As recently as November 1968 the U.S. Supreme Court unanimously declared the Arkansas law unconstitutional. In presenting the Court's decision in the case of *Epperson et al v. Arkansas*, Justice Fortas said,

> . . . the law must be stricken because of its conflict with the constitutional prohibition of state laws respecting an establishment of religion or prohibiting the free exercise thereof. The overriding fact is that Arkansas' law selects from the body of knowledge a particular segment which it proscribes for the sole reason that it is deemed to conflict with a particular religious doctrine; . . .
>
> The State's undoubted right to prescribe the curriculum for its public schools does not carry with it the right to prohibit, on pain of criminal penalty, the teaching of a scientific theory or doctrine where that prohibition is based upon reasons that violate the First Amendment.[48]

Justice Stewart concurred with the decision that this law is invalid, but on the grounds that the intention of the law-makers was too vague to allow a person to obey the law. He agreed with Justice Black that, ". . . a teacher cannot know whether he is forbidden to mention Darwin's theory at all."[49] Justice Stewart goes on to say ". . . Since I believe that no state could constitutionally forbid a teacher 'to mention Darwin's theory at all,' and since Arkansas may, or may not, have done just that, I conclude that the statute before us is so vague as to be invalid under the Fourteenth Amendment."[50]

There remains, then, only Mississippi's anti-evolution law, which will almost certainly be either repealed or modified. There are, however, several state departments of education that have regulations that are restrictive with regard to the teaching of evolution. One of these (South Dakota) requires that teachers must ". . . respect the religious tenets of the pupils in their classroom and should carefully distinguish between hypothesis, theory, and fact with due respect to the religious convictions of the families of students in their classrooms."[51]

Thus the recent U.S. Supreme Court decision mentioned above does not remove all restrictions from the science teacher who discusses this theory. He should inform himself of the local and state restrictions on the teaching of evolution and abide by them, or work for their orderly change.

Special Methods Required

As a general rule, "The law contemplates that general methods of instruction are within the exclusive control of professionally trained teachers, principals, and superintendents and not members of the school board." [52] In spite of this, as we have already seen, there are state laws that insist upon certain methods of teaching. These include such statutes as those requiring the presentation of two 30-minute assemblies each semester on the topic of alcohol, the use of a textbook supplemented by oral and blackboard instruction to teach about communicable diseases, and the devoting of at least 60 minutes per month to the teaching of safety.

More inclusive than state statutes are the regulations of the state departments of education which, of course, must be followed as if they were written laws. Several of these require that laboratory experiences be included in each science course, and require that the local school boards purchase adequate amounts of supplies to allow the teacher to teach in this manner.

Perhaps the most common method of controlling the methods by which a teacher conducts his classes is through the use of state or local curriculum guides. These may or may not be considered to be legal requirements by which the teacher must abide. This point should be determined by the teacher before he plans his course.

Summary

All of the foregoing can be summed up with the statement that a teacher will have to do his homework when it comes to being informed about state and local regulations regarding what must be or cannot be included in the curriculum. Your local supervisor should be able to provide you with the information you need. The topics mentioned in this chapter are intended as guidelines to help you to be aware of the areas in which there may be special laws and to foresee problems before they arise.

CHAPTER 4

Avoiding Trouble: Ensuring Student Safety

THE SCHOOL Law of Colorado states that it is

> . . . unlawful for any person having the care . . . of any child, willfully to cause or permit the life of such child to be endangered, or the health of such child to be injured, or willfully to cause or permit such child to be placed in such a situation that its life or health may be endangered, or willfully or unnecessarily to expose to the inclemency of the weather. . . .[53]

Perhaps the most disconcerting problem a teacher can encounter is that of being involved in a liability suit resulting from injuries sustained by a student. As was pointed out previously, the crux of the question as to whether or not the teacher is held liable in such suits depends upon whether or not negligence was involved. To disprove his negligence a teacher must demonstrate that he acted in a "reasonably prudent" manner, in an effort to ensure the safety of his students.

There are many ways in which a teacher may provide a learning environment that does much to protect the students who work there. He can follow acceptable procedures in the safe storing and handling of potentially dangerous materials in his classroom, and in general keep an eye to the good housekeeping of the laboratory. He can keep himself up to date as to the regulations and laws that must be followed and then pass this information on to his students. He can instruct his students in safety procedures, and he should constantly demonstrate these procedures in his classroom. But above all, the science teacher can promote the safety of his students by continuous supervision of all activities, both in his classroom and outside it. Through these actions, the science teacher can make his laboratory and classroom a safer place than the students' homes or automobiles. In addition to protecting his students, these practices will serve in his favor if he is ever required to defend himself in a suit charging negligence.

What follows is a summary of many of the safety measures required by some of the various state legislatures, the state departments of education, and local school systems. Unfortunately, perhaps, adequate safety regulations have not been adopted by all state legislatures or boards of education. Many state boards of education, however, have produced excellent materials that suggest proper safety procedures. Some of these have been quoted and others listed in the Appendix.

The Importance of Planning

The science teacher can, through careful and detailed planning of each demonstration and laboratory lesson, do much to promote safety in his classroom. For instance, a teacher who leaves the classroom or laboratory unsupervised while he collects forgotten equipment is leaving himself open to a charge of negligence if an accident occurs while he is out of the room. Planning ahead will allow the teacher to have such safety devices as fire-fighting equipment, aprons, and eye goggles ready for use, thus removing the temptation to perform a demonstration without setting the proper example. The teacher who is well prepared will have identified the safest procedures for the collection and disposal of equipment and materials to be used by the students.

While carefully thinking through each demonstration and laboratory exercise, the science teacher may also assess the degree of danger in the procedure that he has planned. As a result of an explosion in a California high school chemistry laboratory, the teacher was found to be negligent, even though the experiment being performed was not particularly dangerous if the students had followed the directions given in the textbook. The court decision includes this statement:

> It may well be doubted whether it is proper in an introductory school course in chemistry to require pupils to

> make and ignite an explosive. It would appear that the dangers of such an experiment, incorrectly performed by young children, might be anticipated; and that the benefits to be derived from its actual performance by each pupil are not so great as to justify the risk of serious injury to the child.[54]

Every demonstration and lab experiment should be examined against the criteria of whether or not the value gained from it is worth the potential hazards involved. It is likely that accidents during a demonstration can be reduced if smaller quantities of dangerous materials are used, or it may be possible to demonstrate the same principle with other materials that are safer to use. If not, it is probable that the danger is not worth the value to be gained from the experience.

Safety Instructions

It is the responsibility of the science teacher to train his students in proper safety procedures, both in general and in terms of the course in which they are engaged. A set of safety rules should be posted in several places around the science room, and these should be discussed frequently with the students.

These rules might include instructions concerning the proper handling of pathogenic organisms, face and eye protection, the use of fire extinguishers and blankets, the proper use of fume hoods, the care of laboratory animals, and the handling of radioactive materials.

The purpose of such instruction should not be to frighten the student but to encourage safe laboratory habits. Indeed, a great deal of damage can be done to the potential future scientists (or homemakers) if they become afraid of using equipment. Instead, they must learn to respect the potential safety hazard that chemicals, equipment, and living organisms present.

It should be pointed out, however, that the simple posting of instructions has been held by the courts to be insufficient. In order to demonstrate that he has taken reasonable care, a science teacher should remind his pupils of the proper safety procedures at the beginning of each lesson that contains dangerous elements.

Safety Equipment for the Science Room

The school building codes of most states include detailed requirements of equipment and facilities that provide for the safety of the students who take science. These items include such things as fume hoods, additional room ventilation, overhead shower heads, eyewash facilities, fire blankets, sand buckets, and fire extinguishers. In addition, it is often specified that chemicals should be stored in fire-resistant rooms that are designed with special ventilation facilities.[55]

Each laboratory that has gas, water, and electrical fixtures at the laboratory tables should be provided with a master cutoff for these utilities. The master cutoff for each room should be located at or near the demonstration desk [56] or just outside the lab door.[57]

It is sometimes tempting to save money through the purchase of less expensive, offbrand, second-quality glassware. The science teacher should always insist that appropriate glassware be supplied in adequate quantities, thus avoiding some of the danger of explosion.

Special provisions need to be made for the disposal of such things as explosives, broken glassware, and some radioactive material. Paper and cloth should always be kept away from chemical wastes. The proper handling of these materials may require the education of the custodial staff, in addition to the education of the students.

Storage Facilities

The storage of some kinds of equipment presents a problem that is unique to the science department. Chemicals, radioactive materials, electric equipment, and many other types of equipment are attractive to students, who often try to gain access to them. Unsupervised tampering can prove dangerous. The nature of some science equipment is such that the equipment itself becomes a potential hazard if not stored properly.

Chemical storage rooms should be designed especially for this purpose. They should be fire resistant, away from all other storage, and well ventilated. In addition, the shelving in these rooms should be adequate so as to prevent crowding of chemicals, and should provide a space on the floor level for the storage of large containers of acids and other dangerous materials, so that ". . . accidental breakage, leakage, rupture of container, or exposure to heat or to water will not result in the commingling of such materials with other substances which might bring about an explosion, violent reaction, ignition, or flammable or noxious gases." [58] It has been suggested that case quantities of bases and acids should be stored on the ground floor or in the basement of the building, to prevent leakage through the floor in case of breakage. In addition, care should be taken that volatile liquids be stored away from sunlight or other heat sources. Minnesota statutes require that these storage rooms be provided with a shower head, and that each shelf have ". . . safety ledges in front and be painted with acid resisting paint." [59]

The Virginia State Board of Education requires that all chemicals be properly labeled. In addition, these regulations state that "All poisonous chemical reagents should be marked 'poison' and stored in rooms or cabinets that can be locked. Students should only be allowed to use these reagents under the teacher's supervision." [60]

Further, ordinary refrigerators, which normally have switches in the doors that produce a spark upon opening and closing, should not be used in the chemical storeroom. If it is necessary for a refrigerator to be kept near chemicals, it is recommended that it be one that is especially designed for laboratory use.

The chemistry storeroom is not the only potential danger spot. In the biology room the safe storage of pathogenic organisms, hypodermic syringes, and pressure devices is just as important. The physics teacher must guard against the improper use of electric and mechanical equipment.

It does little good to have an adequate place for the storage of dangerous equipment if the teacher then allows the room to remain unlocked. In at least one case, the court has indicated that liability may arise if a student takes chemicals from an unlocked storage room without permission and is injured while experimenting with them at home.[61]

Handling Animals and Plants

The presence of live organisms in the biology room can present a threat to the safety of the student and the teacher. A few rather simple precautions can avoid many of these dangers.

Mammals, reptiles, and other wild animals are often brought into the school by students who have caught them in the field. Some of these animals can be dangerous in themselves, through bites and scratches. The National Safety Council warns that wild rabbits, snapping turtles, and certain disease-carrying insects should not be brought into the classroom. Bites or scratches from any animal should receive immediate medical attention, not just first aid. Students should be taught to wash their hands after handling the animals, and to dispose of habitat materials carefully. And, of course, poisonous snakes should not be allowed in the classroom, although allowing snakes in the classroom seems to be a fairly common practice in some schools.

Some school systems have a regulation that special permission must be obtained before certain types of animals can be brought into the classroom, and that once this is done, the animals cannot be kept there for more than 14 days. We feel that this is a worthwhile regulation, and that it probably should be supplemented with the requirement that all wild animals should be held in isolation *outside* the classroom for at least a week before being brought in. Probably the best plan is to purchase all animals from a reputable supply house and to avoid the presence of wild animals in the classroom.

Plants may cause allergic reactions in some students and should be selected carefully with this in mind. In general, those plants that produce great quantities of pollen or spores should be left outdoors.

Before using bacteria in the classroom, the teacher must be certain they are nonpathogenic. The sale of potentially harmful bacteria is tightly regulated, so it is unlikely that a teacher will be able to purchase these without knowing it. However, it is a common practice to collect bacteria from the local environment—the soil, students' hands, and even through the practice of having the student cough on to a culture media. This can prove to be a very dangerous technique and should be avoided.

If bacteria are displayed, even if they are nonpathogenic, the petri dishes should be tightly sealed to prevent students from opening them and perhaps introducing a contamination of a more dangerous type of organism. If possible, disposable petri dishes should be used. If not, the teacher must become expert at the sterilization of contaminated dishes. Common, household-type dishwashers are *not* adequate for such sterilization.

The transfer of bacteria-containing media by means of a mouth pipet is also dangerous and can be avoided. And, of course, good housekeeping is a must in the bacteriology lab, with special accommodations being made for the disposal by fire of all waste materials.

"Experimentation" using the students of the class as subjects is of questionable value unless done carefully. The teacher should carefully consider the possible psychological and physical effects of the use of electric shock, the taking of blood for typing demonstrations, and even the use of simple exercises to demonstrate increase in heart rate before making them a part of his teaching program.

Eye Protection

During the past few years about three-fourths of the states have passed laws that require students to wear "eye protective devices" while taking part in certain types of activities. Many of these laws are quite specific in listing the courses (chemistry and physics) as well as the types of activities that require the use of these devices.

In general, these statutes require that adequate protection be provided for the eyes of students, visitors, and teachers who are engaged in, or observing, activities that are likely to cause physical injury to the eyes. These might include, but are not limited to, such activities as, "working with hot liquids or solids or with chemicals which are flammable, toxic, corrosive to living tissues, irritating, strongly sensitizing, radioactive, or which generate pressure through heat, decomposition, or other means." [62]

Also included in many of these eye protection statutes may be a standard for the quality of the goggles. The one that seems to be the most commonly used is that set by the U.S.A. Standards Institute Safety Code for Head, Eye and Respiratory Protection (Z2.1-1959), promulgated by the United States of America Standards Institute, for industrial quality eye protective devices. A portion of that standard was revised in 1968 and became Z87.1-1968, Practice for Occupational and Educational Eye and Face Protection.

First Aid Kits

Special mention should be made of first aid kits. A few states require that these be available in each classroom where accidents are likely to occur. At least one state (California) requires that the kit be in the possession of the teacher who is conducting a field trip. However, it should be remembered that no one is authorized to give more medical aid to an injured person than is absolutely necessary. If, as a result of the treatment, the injury is made more serious, the "Good Samaritan" may be held liable for his actions.

Look into your local requirements pertaining to first aid kits and the giving of first aid.

Field Trips

The watchword in taking a safe field trip is "planning." As has been pointed out elsewhere, the use of permission slips is of doubtful value in protecting the teacher from liability suit, except that their use tends to demonstrate that the teacher has planned his trip carefully and well in advance. As further precaution, the teacher should visit the site of the trip *immediately prior* to taking his students there. In this way, he can survey the locality for potential hazards and avoid many of them in advance. In addition, the science teacher should prepare his students for the trip, informing them not only of what they are to look for and learn from the experience, but also of what dangers might be encountered. Instruction in the identification of animals and plants to be avoided should be given as well as a list of clothing and equipment to be taken along. The presence of a first aid kit that contains the equipment that might be needed on the trip has already been mentioned. Of course, adequate supervision is a must. The Florida safety guide, for instance, suggests that no more than ten students per adult should be allowed on a science field trip.[63]

Fire Regulations

Probably all schools have occasional fire drills, which are required by local law. The holding of these drills implies that the classroom teacher has a responsibility to learn the building evacuation procedures and to teach them to all of his students.

Local fire regulations will generally specify that certain exit paths shall be kept open at all times. Science teachers may, at times, be tempted to disregard these regulations by partially blocking these exits with science display tables, empty packing cartons waiting to be discarded, or with equipment that will not fit conveniently into the science storage room. This, or the locking of fire exit doors, should be avoided at all times.

Radioactive Materials

During recent years, more and more radioactive materials have found their way into the science classrooms throughout the country. These materials, spontaneously emitting ionizing radiation, may be a potential hazard unless they are stored and used carefully. In recognition of this fact, several state legislatures have passed laws pertaining to the safe use of these materials.

In general, these statutes authorize some agency such as the state department of health to administer a licensing and regulatory program.[64]

Further regulations may be imposed by the state board of education or by the local school division. Minimum requirements should contain information as to methods of labeling radioactive materials, storage, use, and disposal. For example, the Los Angeles City School District regulations specify that a Geiger counter be used after each use of these materials to check for traces on the hands and bodies of every person who has worked with the material. Further, these regulations require that rubber gloves be worn when handling alpha emitters, and that glass or aluminum shielding be used with beta and gamma sources. Twelve-inch-long tongs are also required for handling the materials.[65]

Model Rocketry

A few states, as the result of several tragic experiences involving students who attempted to launch model rockets, have enacted statutes defining the types of rockets that can be fired, where this may be done, and in what manner. Some of these statutes attempt to define the design, construction, and weight of the rocket as well as to control the type and amount of propellant materials.[66] The Connecticut law requires that, "At least one adult person shall inspect each model rocket before flight and shall supervise the launching of each model rocket." [67] A requirement such as this would seem to imply that the supervising person is responsible for determining whether or not the rocket conforms to the statute's restrictions. If the science teacher is to serve in this capacity, he will find it necessary to read the laws of his state very carefully. In the event that his state has no statute relating to model rockets, we would suggest that the science teacher obtain a copy of the Connecticut law and use it as a minimum safety standard. By so doing, he may demonstrate that he has acted as a "reasonably prudent" person.

The regulations of the Los Angeles City Schools require that teachers ". . . discourage amateur experimentation with rocket fuels." In California, rockets are classified as "fireworks," and therefore their discharge is prohibited.[68] Likewise, the State Board of Education of Virginia requires that ". . . the firing of rockets on or about school grounds is strongly discouraged . . . no student will be permitted to bring rockets or rocket fuel to school, nor will they be allowed to carry rockets or rocket fuel on school buses." [69]

The Federal Aviation Agency has established regulations concerning the firing of rockets. In part, these regulations forbid the operation of unmanned rockets—

a. In a manner that creates a collision hazard with other aircraft;

b. In controlled airspace;

c. Within five miles of the boundary of any airport;

d. At any altitude where clouds or obscuring phenomena of more than five-tenths coverage prevails;

e. At any altitude where the horizontal visibility is less than five miles;

f. Into any cloud;

g. Within 1,500 feet of any person or property that is not associated with the operations; or

h. At night.

(From Federal Aviation Agency Regulations, Part 101, *Moored Balloons, Kites, Unmanned Rockets and Unmanned Free Balloons.*)

Any person planning to launch a rocket, even a small one, should obtain the latest FAA regulations from the Government Printing Office. The National Association of Rocketry also has helpful materials, including a safety code.

CHAPTER 5

Avoiding Trouble: Knowing the Special-Interest and Pressure Groups

THROUGHOUT the United States there are groups of citizens who are particularly concerned about certain aspects of teaching in the public schools. Many of these groups, whether they are nationally organized or only a local faction, want to promote the teaching of specific topics within the schools. Other groups desire to have certain other topics removed or excluded from the curriculum. Still others, less concerned about the topics themselves, wish to regulate particular activities that take place both within and outside the classroom.

In some instances, groups such as these have encouraged legislators to pass laws that affect the science teacher. Other groups have been less successful in getting their favorite laws passed, yet form a strong group within the community in which the science teacher works.

Whether we, as individual science teachers, agree with the philosophy and programs of each of these groups is a matter of our own background and education. If we do sympathize with a group's goals, we may consider it to be a "special-interest" group. If, on the other hand, we feel that the proposals of a specific group are unrealistic and damaging to our program, we may call it a "pressure" group. In either case, the wise teacher will be aware of the existence of these groups and attempt, where possible, to work with them. It is only in these ways that he will be able to know what these groups expect him to do and perhaps be able to modify the expectations of the group so that his program will progress satisfactorily. Through his awareness and cooperation, the science teacher may be able to avoid trouble from these groups.

What follows is not a complete discussion of all of the special-interest and pressure groups that exist in this country, for the list would be almost endless. It would include, among many others, such groups as the local Parent-Teachers Association (P-TA), the state P-TA, the Daughters of the American Revolution, conservation groups, The Society for the Prevention of Blindness, The Society for the Prevention of Cruelty to Animals, local bird and garden clubs, etc. It is hoped that this chapter will indicate some of the more common and well-organized groups. These groups include people who are interested in sex education, the use of animals in the classroom, the collection of specimens, and the launching of rockets, to name just a few.

Teaching About Sex

Many people in almost every community feel that one of the most urgent needs of schoolchildren is instruction in sex education. In the same community, one will often find an equally vocal group of citizens who insist that such instruction is not appropriate for the schools and do not want the topic to be included in the curriculum. As examples of these divergent viewpoints we might cite the fact that only a few years ago one school board ordered that line drawings of human reproductive organs be printed over with solid black ink; almost at the same time, another state was in the process of writing a state law that required sex education to be included in the curricula of all schools. Thus, some teachers find that they must teach sex education while others have to concern themselves with laws that restrict such teaching. Examples of these laws were mentioned briefly in Chapter Three.

If the teacher is engaged in teaching topics that are related to the topic of sex education, as almost all biology teachers are, there are several things he can do to avoid trouble. The first of these is to learn all he can about the laws of his state and the regulations of his state department of education and of his local school board. Often, these will give him some guidelines within which he can work.

While in the process of planning a sex education program, the teacher should work closely with his administrators and state science supervisor. In this way, he can enlist the backing and advice of the professional educators who may be in a better position than he is to sense the emotional climate of the community.

Most importantly, the teacher will find that it pays to maintain good lines of communication with the parents of his students and with other adults who are concerned about the teaching of sex. He will do well to advise and solicit advice from both sides of the issue—the parents who favor such instruction and those who do not feel that the topic should be taught. In many cases, the school parent-teacher group will not be an adequate cross section of the community, and it will be necessary for the teacher to try for a broader scope for his contacts.

In his meetings with the parents, the teacher should carefully explain, *in advance*, *why* he feels that sex education is important, *what* he intends to teach, and *how* he plans to present the subject matter. He should assure these groups that the topic will be treated as a natural, integrated part of the curriculum. As the program progresses, he should continue to inform the parents and his administrators of his successes and failures. A *continuous dialogue* is a must for a successful program.

There are many factors for a teacher to consider before he starts a program in sex education. Is he, the teacher, emotionally and academically capable of success in the program? What will be the definition of "sex education" in this course? Will it simply be a course in human reproduction, or will it involve elements of character building? What are the backgrounds of the students who will take the course? How mature are these students and what are their interests at this stage? Can we expect a single value system to be acceptable among the students in the class, and if not, what deviation will be considered to be acceptable by the school and by the community?

To quote from the resolution on sex education produced by the Maryland State Board of Education, "There is a growing realization that we really do not have a choice as to whether we will or will not teach sex education. The question is, 'What kind?' Sex education is not new to our modern world. All societies, including the most primitive, have given sex guidance and instruction to their young people in the form of information, misinformation, taboos, and sociocultural conditioning to approved and disapproved sexual behavior. Only in very recent years have we begun to approach these societal barriers in a positive and constructive way." [70]

Through a consideration of these questions and the feelings of the various groups in his own community, the teacher may approach the teaching of sex with some confidence. To ignore them will certainly lead to problems.

Teaching Through the Use of Animals

As was mentioned in Chapter Four, there are very few laws regulating the use of animals in the classroom. A few states, such as Maine and Massachusetts, have statutes that specifically prohibit vivisection. In addition, the Massachusetts law restricts the dissection of dead animals to the classroom and forbids the exhibition of dissection techniques to students other than those enrolled in the class. At the other extreme, most other states seem to have no laws on the subject, leaving the regulation to either the state board of education or to the local school boards.

Those of us who have taught biology know, however, that the use of animals in the classroom can lead to trouble even in the absence of state laws. There is some danger to the health of students when live animals are kept in the classroom, and some of these have been discussed in Chapter Four. But even if we try to avoid the health hazards, the mishandling of animals may still lead to serious problems. The basic goals of biology, as stated by National Society for Medical Research and several state departments of education are ". . . to achieve an understanding of life, and to advance students' knowledge of the processes of life. Such studies lead to a respect for life." [71] If we do not emphasize respect for life, we have failed in our responsibility.

Another aspect the teacher should consider when he uses live animals in his classroom, for any purpose, is the emotional impact of such use on his students. The attitudes of pupils will vary from community to community and from home to home. The misuse of animals may offend the moral sense of students or, perhaps worse, may teach a lack of respect for life. Either condition will inhibit the reaching of the goals stated above.

The extent and limits of these emotional involvements with various animals by children is an interesting study in itself. Many children will react violently to investigations involving mammals but not at all to experimentation that uses reptiles or amphibians. In other children, the dissection of any vertebrate, even fish, brings forth strong antagonistic emotions. The teacher should explore the possible use of other types of organisms than these. It has been suggested that the invertebrates and protozoa can often be used to illustrate the principles of certain experiments to the same degree than larger animals can. Where this is true, the teacher may do well to consider them.

If the science teacher feels the educational value of the use of live animals outweighs all the disadvantages, he should plan carefully the acquisition of the animals. As mentioned previously, if at all possible, laboratory animals should be obtained from a reputable supply house.

In August 1966 Congress passed a law (Public Law 89-544) authorizing the Department of Agriculture to regulate the transportation, handling, and sale in interstate commerce of dogs and cats, and to provide standards for the humane treatment of these and other animals used in research or experimentation.

The prime responsibility for housing, feeding, and handling of the animals falls upon the teacher. Sanitary conditions must be maintained, not only for the safety of the students in the classroom but for the health and comfort of the animals. Special arrangements will have to be made to ensure that animals receive adequate care during vacation periods.

The nature of the experiment to be performed on the animal will determine the type of practice to be followed. Nutritional experiments should be continued only so long as is necessary to show the desired results, and then the animal should be returned to optimum health. Teachers who allow an animal to die because of poor diet defeat the purpose of such experiments. In many cases, the students will remember only that the teacher allowed the animal to suffer rather than the fact that certain dietary elements are necessary for good health. Not only is this bad, educationally, but the teacher runs a risk of incurring the ill will of the community.

The administration of drugs, radiation, pathogenic organisms, or the use of surgical techniques should always be carefully controlled by an expert technician. If the teacher feels his own background does not qualify him as an expert he would do well to look for proficient help elsewhere or omit the experiment from his course. And, any procedure that involves pain to the animal should be carried out under anesthesia.

A bill (HR 12286) was proposed to Congress in June 1969 that would further assure humane care, handling, and treatment of laboratory animals in government and government-sponsored research facilities. The bill provides for technical assistance and the dissemination of information about the care of laboratory animals.

The laws of some states require that the humane treatment of animals be observed in the schools. Some, such as the Florida statutes, specify that causing pain and suffering to the animals must be avoided, except when done in the interest of medical science. The Attorney General of Florida has indicated that he feels that secondary school experimentation may be considered to fall into the category of medical studies and thus the law would allow experimentation with live animals, so long as they were properly supervised and care was taken to avoid unnecessary pain to the animal.[72]

He further observes, however, that allowing students to conduct experiments on animals without proper supervision is prohibited.

For the National Science Teachers Association's policy on this matter, see page 88.

Collecting Specimens

Although the practice is less common now, perhaps, than in the past, many teachers require their students to make various collections. It is not uncommon for students to develop interests through these activities that have developed into life-long hobbies or into professions.

There are drawbacks even to the simple process of making a collection, however, and the science teacher should be aware of them. The dangers to the health and well-being of the student are fairly apparent and need not be discussed in detail here. Each student who is making a collection should be instructed in the identification of poisonous and dangerous plants and animals that he is likely to encounter. The teacher should also see to it that each of these students knows how to care for himself and for others in the event that he is injured while on a collecting trip.

The growing awareness on the part of the general population of the value of our natural surroundings and the necessity of protecting them has added to the problem of collecting from the field. The science teacher who wishes to make a collection himself or who encourages his students to do the same should know the local laws and regulations, as well as the general feeling of the citizens of his community, concerning these activities. Which animals and plants are protected by the laws of the state? Are there certain areas in the community that are set aside as game preserves where the collection of specimens is prohibited? Is the collection of rocks and minerals controlled in the parks of the area? Which agency controls the various archeological sites of the state, and what are the rules of this agency pertaining to the digging in these sites? What would be the reaction of the public to a science fair project of bird skins or bird eggs? The alert science teacher will do well to consider these questions before he directs his students in their collection making.

Model Rocketry

Whether or not the science teacher should encourage his students to fire model rockets, or whether such activity should be included in his course or not, is a complex question. The basic problem centers around the fact that the launching of a model rocket is a highly exciting and motivating experience for many science students. In his attempt to use techniques that will catch and hold the interest of his students, the science teacher may overlook the dangers of the activity. Some of the safety aspects of model rocketry were mentioned briefly in Chapter Four.

To further complicate the attempt by the teacher to decide whether or not to work with model rockets, there are many groups who have a special interest in this activity. Some of these people feel that the safest course is to actively promote the firing of these devices under controlled, safe conditions. Other groups say that the entire activity is too dangerous, even under the best of controls, and should be prohibited.

The science teacher must first assure himself that he understands the laws of his state that pertain to model rockets. These may not be easy to find in the law books, since various types of laws relate to the project. For example, a state may have laws concerning fireworks, and the teacher will have to determine whether or not the rocket he is working with falls into this category. The state science supervisor should be of help on this problem. On the other hand, it may be that the fuel of the rocket might be considered to be an explosive, substances that are normally tightly controlled in most states. Certainly the rocket would be considered to be a nonguided aircraft and would therefore fall within the jurisdiction of the Federal Aviation Agency. Thus, the science teacher who wishes to fire a model rocket will find it necessary to consult first with many people—the Civil Aeronautics Authority and whichever of the state authorities that might have some regulatory power over the project.

As with all unusual projects, the teacher who wants the cooperation of the school administration and the community will keep them informed and enlist their support. Particularly will he be in touch with the parents of the students who will participate in the work. Not only will these people be of some help to him directly, but in the event that someone is injured, the teacher may be able to demonstrate that he planned the project in a careful manner well in advance.

Since few teachers have had any special training or experience with the handling of explosives, the help of an expert should be sought. There are engineers or scientists in most communities who are capable of giving adequate supervision to students doing projects of this type.

CHAPTER 6

Avoiding Trouble: Accounting for Funds and Equipment

THE *MONEY*, supplies, and equipment that are used by a public school belong, in the final analysis, to the state. Since these are public property, there are laws and regulations that are designed to protect them from misuse. All teachers are responsible to their local administrators for certain records dealing with such details as enrollment and attendance, distribution of books, and fees collected. The science teacher is held accountable for these items and often for many more, because of the nature of his job. Some of these are considered in this chapter. This discussion, however, is not all-inclusive and as with other laws, the teacher will have to inform himself of all local accounting regulations.

Textbooks

It would seem to be a growing practice for a state or a local school system to purchase and distribute textbooks to its pupils. Where this is done, the books are considered to be public property and must be accounted for. The responsibility for this lies with the administrative officer of the local school system, of course, but this must be relegated to the classroom teacher as a matter of practicability. Thus, in the final analysis, it is the teacher who is held accountable for the distribution of the books.

Money

Almost all teachers find it necessary to handle money at some time as a part of their jobs. They may find themselves selling laboratory books, collecting fines, trying to keep track of laboratory fees or breakage fees, or even acting as a go-between with lunch money. At the beginning of a school term, the science teacher may find himself handling hundreds of dollars.

In many cases, the fees collected by the science teacher will be deposited in the school office, where an official record is kept. Some states require that funds collected from a specific source shall be earmarked and used for a specific purpose. The science teacher should maintain his own record of such funds, so as to be informed as to the amount of money his department has available for specific purposes. He should also be certain that his record agrees with the official account record. Such verification can usually be made at the time of the official audit report to the system's central administration.

Equipment Purchased with Federal Money

As is the case with textbooks purchased with local or state funds, equipment in the schools is considered to be public property and must be properly accounted for. This general rule is also applicable to those pieces of equipment that have been purchased with federal funds. The science teacher, perhaps more than those in other areas, must be responsible for a great deal of equipment of this type. Most of this equipment used by the science teacher will have been purchased with funds matched by National Defense Education Act (NDEA) money, but a growing amount may have come from funds provided by various titles of the Elementary and Secondary Education Act (ESEA). When we discuss the requirements of the National Defense Education Act, the science teacher should keep in mind that equipment purchased with ESEA funds and with local funds may carry similar accounting requirements.

In order to participate in the NDEA matching-funds program, each state must prepare and file a plan for approval by the office of the Commissioner of Education, U.S. Department of Health, Education, and Welfare. In this plan, the state will detail the administrative procedures that it plans to follow, as well as establish priorities, standards, and procedures for the program. Thus, in each state, the details of the accounting requirements differ somewhat.

Each state plan, however, will follow the general outline prescribed by the federal law. For example, the statute requires that each state plan "... must provide for keeping such records and making such reports as the Commissioner may consider reasonably necessary to enable him to perform his duties . . ."[73] In order to accomplish this, the Commissioner requires each state to submit an annual report which contains, among other things, a financial report showing expenditures, audit results, and a summary and evaluation of the progress of the state in its plan to strengthen instruction. In other words, the state department of education of a participating state is required to collect records that account for the equipment purchased and which will help in the evaluation of the impact of this equipment on the education of the children in that state.

To achieve these goals, each state has formulated specific regulations concerning the records to be kept in the local school. In general, the auditor will require that all receipts and project applications be kept until audited and that these be cross-referenced. In some states, these records must be kept separate from other invoices and purchase records. Other states require that duplicate records be kept. While the maintenance of such files are the responsibility of the school district's central administration, in many cases some of the administrative responsibility has been shifted to the science departments of the individual schools.

Many state plans require that separate inventories of NDEA-purchased equipment be kept, and in almost all states certain items of this equipment must be marked in a particular manner. Since these requirements, as is the case with all laws, are minimums the local regulations may go much farther. In some cases, for example, the local school district requires that *all* NDEA-purchased equipment be marked in such a way as to indicate the year of purchase. In at least one case, this has been carried so far as to include the marking of test tubes!

The plans of the various states almost always require that equipment purchased with the help of federal funds be properly stored and cared for. In some cases, auditors have been known to request that an individual piece of equipment be produced for his inspection. If this cannot be done satisfactorily, according to some state plans, the funds used for the purchase of the item must be reimbursed to the state.

NDEA Title III Guidelines states that "The major job in evaluation, however, is the assessment of the effect which the state's Title III program has had on instruction in the classroom." [74] With this in mind, the writers of the various state plans have had to include some procedure for estimating the value of the use of the equipment purchased. While the details of how this information is to be collected vary greatly from state to state, it is safe to assume that each science teacher will be required to maintain some type of usage record for at least major items of equipment.

The Council of Chief State School Officers produced a document *Purchase Guide for Programs in Science and Mathematics.*[75] Originally it was designed to assist state and local school officers in administering Title III of the NDEA, but it no longer makes reference to the federal requirements.

CHAPTER 7

If, Nevertheless, Trouble Comes...

AS *WE HAVE SAID* several times, the science teacher who conducts his laboratory and field work carefully and with due consideration given to the safety of his students will not normally be held liable for injuries that might occur. And, if he informs himself of local and state regulations that concern his job and abides by them, he will not find himself convicted of neglect of duty.

However, in spite of a teacher's being conscientious and careful, he may find himself in trouble. He may find himself a defendant in a liability suit, even though he feels he is not guilty of negligence. Or he may be dismissed from his position without good cause. Pressure groups may make attacks on certain subject areas. Or, as has been the case in several communities recently, the voters of the district may refuse to tax themselves sufficiently to meet the school's payroll in the middle of the year. In cases such as these, where does the teacher turn for help?

Liability Suits

If a teacher finds himself threatened with a suit charging that his negligence caused injury to a child, he will have to defend himself against the charge in order to avoid being held responsible for the damages. How he will handle this will depend upon the laws of the state in which he works and upon certain other considerations.

In Chapter Two we mentioned that there are a few states that have laws that protect the teacher from situations such as this. These laws will not prohibit the suit entirely, only transfer the responsibility from the teacher to the school district. This may be done only when the injury is caused by the action of a teacher who is performing his required duties. In at least 15 states the school law allows the school districts to purchase liability insurance for their teachers with school funds. In fully half of the states, however, the statutes do nothing to protect the teacher from liability suits.

Many of the various state-level education associations carry liability insurance for their members. In the usual case, membership in one of these professional organizations will provide the teacher automatically with some protection. The amount of $50,000 seems to be the usual amount of coverage given by this type of insurance. A few local or state-wide science teachers' organizations also participate in such plans. In some cases, the intent of this insurance is to supplement the "save harmless" laws, which allow the school district to protect the teacher only against accidents that occur while the teacher is performing *official* tasks.

As further protection against liability suits, of course, the teacher may wish to secure his own insurance policy. This protection can be purchased in the same manner as other insurance policies.

If a suit is filed, whether against the teacher himself or against the school district, and whether insurance is involved or not, the teacher will be asked to demonstrate that he has acted with "reasonable care." Suggestions as to how he can do this have been offered throughout this book. The presentation of this defense in a courtroom should not be attempted by the teacher, himself. In order to do this effectively, he will need the assistance of someone trained in legal procedures.

Where the teacher is protected by state law or by insurance, legal assistance may be provided. Where this is not the case, it will be necessary for the teacher to employ his own lawyer. Care should be taken to obtain the services of a person who is well versed in school law as well as in the liability laws of the state.

Professional Problems

In a variety of situations in the past, teachers have been treated unfairly by administrators, school boards, or members of the community. Teachers have been discharged or harassed because of prejudice or out of political motives. Or teachers have found themselves involved in a fight for better salaries or improved educational practices. When a teacher finds himself involved in such situations, he needs the help of the teaching profession.

The first source of help is, of course, the local classroom teachers association. Through concerted efforts of the group, a great deal can be accomplished within the framework of state laws and local regulations. Every teacher owes something to his local professional organization—not only his yearly dues but his active participation. It is largely through such efforts that he and his students receive the help they need. The second source of assistance is from the state professional education associations and here, too, participation is needed.

At the third level stand the national organizations—the National Science Teachers Association and the National Education Association. The NEA DuShane Emergency Fund can provide funds toward the cost of legal action, consultant help, and the like in cases where teachers receive unfair treatment in their community. If an individual wants DuShane Fund assistance, he should send for an application from the National Education Association, 1201 16th St., N.W., Washington, D.C. 20036.

As is the case with the organizations at the local and state levels, the national organizations cannot serve the profession effectively without the support of the classroom teacher. Simple membership is not enough. The classroom teacher must be willing to devote his time to the organizations in any way that he can; and he must be willing to support the various funds with his contributions whenever he can. Teachers should also help to identify and analyze sensitive areas and to formulate position statements as professional guidance in these areas.

Summary

Regardless of the type of problem the teacher encounters, he need not fight it alone. Help is available to him through a

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variety of sources—the state statutes, the local regulations, insurance, local lawyers, and the local, state, and national professional organizations.

The first step the classroom science teacher (and his supervisors and school administrators) should take is to become well acquainted with his local situation. He should understand the local laws and how they restrict and protect him. He should know the extent of the protection provided by the local school district. He should understand to what extent and in what types of situations his local, state, and national organizations are able to help him.

Then, before he encounters trouble, the teacher should work actively to stimulate the passage of more adequate and equitable laws. He should also exert effort to improve and strengthen his professional organizations and to encourage development of profession-wide position statements.

If, nevertheless, trouble comes, the teacher should act in a carefully planned, professional manner. He should appeal for help to the local and state professional organizations. He should obtain professional legal help, if it is needed, either through his own initiative, through his insurance plan, or through his teachers organizations.

CHAPTER 8

Taking Positive Action

As *WE HAVE SEEN*, the work of the science teacher is restricted by some statutes and by many more state and local regulations. To a lesser extent, perhaps, his actions are prescribed by other statutes and regulations. Some of these laws and regulations seem overly restrictive to most science teachers, making it more difficult to teach children than it need be. Many of these laws and regulations are basically sound, but they are written in such a way that they do not do the job that was intended. Some are worded so indefinitely that they seem to be "all-inclusive." Others are so precise that they omit areas that ought to have been included. Still others are antiquated and no longer applicable to the teaching of a modern, up-to-date science course, yet they remain on the books as constant threats to our peace of mind.

It is unlikely that any of these laws were passed with the intent of making the science teacher's job more difficult. The basic problem would seem to be that these laws were written and passed by legislators who lacked complete knowledge of the teaching process, of the philosophy of the schools, or of current state-of-the-art in subject matter. Even the regulations of the state department of education may have been formulated by persons who are somewhat out of touch with the realities of day-to-day, classroom teaching. The same may be true of regulations passed by local school boards.

Where these laws and regulations concern the science teacher, he should put forth some effort to see that they are as carefully written as possible. But what type of positive action can a single classroom science teacher take?

The isolated teacher, working by himself, cannot wield very much influence over the passing of new legislation. His only action would seem to be that of any citizen—the writing of letters to the men who represent him in the legislative or administrative bodies of his state and in Washington. Fragmented efforts such as this can only be persuasive if similar communications are coming from a variety of sources. Moreover unless the teacher is known to the legislator personally, it will be difficult for the person who receives his letter to properly evaluate the suggestions that he receives.

How then can the lines of communication between the classroom teacher and the law-making or regulation-forming body be kept open? The answer, of course, is through the efforts of a group made up of teachers, supervisors, and administrators. A professional organization, composed of a large percentage of the classroom teachers who are both active and interested, can speak with a voice that is loud enough to be heard by any legislative or administrative group, a voice that speaks from experience in the field of education.

The starting point is the local classroom teachers association. Such a group can be more aware of the local situation and its problems than can anyone else in the community. Because of this knowledge, the local professional organization can be a valuable resource to the local board of education and to the administration of the local schools.

The local professional group can also act as a contact with the state board of education, probably through the state-level supervisory staff. Since it is impossible for the state science supervisor to know all of the local problems in his state, he will have to rely upon groups of science teachers from various areas for advice and other types of help. Make yourself known to this person and offer your help.

A third function of the local group of teachers would be to function as a clearinghouse for information concerning legislation that will be presented in the future, both at the state and federal level. For example, the *Congressional Record* should be checked regularly by your local legislative committee and reports on educational legislation sent to each teacher in the community. Similar work can be done for anticipated local legislation, but the key to success in all of these activities is a viable organization of teachers who are interested in being informed.

Perhaps the most potent political force working to influence educational legislation within any state is the state education association. Through direct contact with the members of the legislature, the state board of education, and the staff of the state superintendent of education, this group can and should wield a great deal of influence.

Each state education organization should have an active legislative committee. Its members should vigorously collect information about possible legislative action that will develop in the future and report this directly to the members of the association for their information and consideration. The committee should conduct discussions with as many classroom teachers as possible, in an attempt to formulate statements that reflect the concern of the profession. These statements should be constructive. This committee can then work actively for the passage of statutes and regulations that will result in improved education throughout their state. Such committees cannot function effectively without the concerned support of all of the teachers in the state.

Another way in which teachers can take positive action through both their local and state organizations is to make new legislation unnecessary. Laws and regulations are usually put into effect because of the existence of a situation that is antisocial, unprofessional, dangerous, or unhealthy. For example, the statutes requiring the use of goggles in the science laboratory may seem unduly restrictive because of the vague wording of the requirements. These laws, however, were thought to be necessary because the eyes of students were not being adequately protected. If the local- and state-level science teacher organizations of the various states had formulated their own rules concerning the wearing of eye protective devices, it is likely that this piece of legislation could have been avoided. At the very least, it seems likely that concerned professional organizations whose members recognized the problem could have prevented the passage of such vague laws and could have substituted for them regulations of the state board of education that were more closely attuned to the realities of the classroom and laboratory.

Summary

The classroom science teacher is in a unique position in that he—and only he—knows fully what the problems of his classroom are. Because of this knowledge he has a very real responsibility to influence the types of laws and regulations that are formulated in an attempt to improve education. Through working actively with his local, state, *and* national professional organizations, he can communicate his knowledge to the legislative and administrative bodies who have the responsibility for framing these laws and regulations.

His participation in these organizations must take several forms. First, he must be a dues-paying member of all three types of organizations. Second, he must work actively to strengthen all three organizations. Third, he must encourage the formulation of various types of committees and be willing to devote time and energy as a member of them. Fourth, he must become aware of the types of legislation that are being discussed, both locally and nationally, and make his considered opinions heard. And lastly, he must work for the establishment of association rules for those problems of the classroom where professional responsibility and agreement will assure pupil safety and freedom in teaching and curriculum.

Appendix

NOTES

1. Duker, Sam. *The Public Schools and Religion: The Legal Context.* Harper and Row, New York. 1966. p. 12.
2. *United States* v. *Butler*, 297 U.S. 1, 56 Sup. Ct. 312.
3. *Helvering* v. *Davis*, 301 U.S. 619, 57 Sup. Ct. 904.
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POLICY STATEMENT ON SEX EDUCATION

Adopted by the New Jersey State Board of Education
January 4, 1967

(The following statement is taken from *Guidelines for Developing School Programs in Sex Education*. Published by New Jersey State Department of Education, Division of Curriculum and Instruction and the Office of Health, Safety and Physical Education, 1967. It is reproduced here with the permission of the New Jersey State Board of Education.)

Sex education is a responsibility which should be shared by the home, church and school. The State Board of Education and the State Department of Education support the philosophy that each community and educational institution must determine its role in this area. Therefore, the State Board of Education recommends that each local Board of Education make provisions in its curriculum for sex education programs.

Sex is a major aspect of personality. It is intimately related to emotional and social development. Being boy or girl, man or woman, conditions one's sense of identity, ways of thinking and behaving, social and occupational activities, choice of associates, and mode of dress. Sex cannot be understood simply by focusing on physiological processes or classifying modes of sexual behavior. Human sexuality—the assumption of the individual's sex role—can best be understood by relating it to the total adjustment of the individual in his family and society.

The primary purpose of sex education is to promote more wholesome family and interpersonal relationships and, therefore, more complete lives. It is not a subject that lends itself readily to "lecturing" or "telling." An approach which encourages open discussion and solicits the concerns of the individual is needed to help young people develop appropriate attitudes and understandings regarding their sex roles. This approach is possible if parents, clergy, teachers, health personnel and others responsible for the education of children are informed and secure in their own feelings about sex.

Sex education is a continuing process throughout life and therefore must be planned for during the entire school experience of the child. Schools are important agencies in the development of healthy habits of living and moral values.

The Department of Education recommends that appropriate programs in sex education be developed by educational institutions cognizant of what is desirable, what is possible and what is wise.

PHILOSOPHY OF THE PROGRAM OF SEX EDUCATION
(New Jersey)

(This is not part of the Policy Statement above, but it appears in *Guidelines for Developing School Programs in Sex Education,* published by the New Jersey State Department of Education and reprinted here with permission.)

It is often assumed that inasmuch as human beings are either male or female, all individuals will necessarily find and fulfill their masculinity or femininity sex roles. For this reason a consideration of male and female sexuality has often been omitted from sex education in the schools.

Sexuality, an important aspect of personality involving maleness and femaleness, finds expression in behavior from infancy and throughout life. It begins at home in the family setting; perhaps the very first moment a mother holds and fondles her baby, puts her baby to her breast and rocks the baby in her arms. We must not fail to recognize that the home is essentially the place where the first concepts of sexuality occur. Role images are developed at the pre-school ages that serve as guidelines for behavior throughout life. One's individual adjustment, happiness, success as a family member and civic contributions are either enhanced or diminished by success or failure in fitting into the appropriate sex role and in the management and direction of his sexuality.

The school, the parents, and the church share a concern for sex education and its ultimate goal—responsible family and societal living.

Since the school reaches all of our young people at one time or another and is the only institution with which to help young people with their personal as well as their intellectual problems, it has become increasingly apparent that the school must assume more of the role than it has in the past.

The school, therefore, has the moral obligation to insure that boys and girls are afforded those educational opportunities and experiences which reinforce wholesome attitudes and behavior patterns required of living in a pluralistic society.

INCOMPATIBLE CHEMICALS
(Florida)

(The following list is taken from *Safety In The Science Laboratory*, a publication of the State Department of Education for the State of Florida. Reprinted with permission.)

THESE CHEMICALS	SHOULD NOT COME IN CONTACT WITH:
Hydrocarbons: e.g. Propane, Benzene, Gasoline, etc.	Fluorine Chlorine Bromine Sodium Peroxide
Iodine	Acetylene Ammonia Hydrogen
Mercury	Acetylene Ammonia
Nitric Acid (con.)	Acetic Acid Hydrogen Sulfide Inflammable liquids and gases
Potassium Chlorate	Sulfuric and other Acids Any organic substance
Potassium Permanganate	Sulfuric Acid Glycerine Ethylene Glycol
Sodium Peroxide	Ethyl or Methyl Alcohol Glacial Acetic Acid Carbon Disulfide Glycerine Ethylene Glycol Ethyl Acetate
Sulfuric Acid	Potassium Chlorate Potassium Perchlorate Potassium Permanganate Similar compounds of other light metals

SAFETY RULES AND REGULATIONS
(Los Angeles)

(The following material is taken from "Handbook of Safety Rules and Regulations." In *The Administrative Guide—Los Angles City School Districts*. Division II, Chapter VIII. Los Angeles City Schools, Division of Instructional Services. February 1965. Reprinted with permission of the Los Angeles City Schools.)

a. Laboratory Safety Regulations. Each student in a laboratory course using chemical supplies shall be provided with the standard printed forms of safety procedures and regulations (Form 34 H-108) as a part of his safety instruction. Each student shall sign a statement indicating that he has read and will abide by the safety regulations. This statement shall be on file with the teacher before the student may do any laboratory work.

b. General Precautions. The following general precautions shall be followed:

1) Students shall perform only those laboratory operations in which they have received instruction.

2) Students shall use only materials and equipment authorized and shall follow procedures authorized by the teacher.

3) The teacher shall provide means of checking the student's knowledge of safety procedures before permitting him the use of the facilities.

4) In classes below the college level, only teachers and laboratory assistants shall have access to the stockroom. There shall be no more than one student laboratory assistant in the stockroom during each period of instruction.

5) Students shall do laboratory work under the supervision of a qualified teacher. A qualified teacher is a certificated person who has sufficient knowledge of the work to enable him to be aware of any unsafe practices.

6) Students in classes below the college level shall not have access to or handle the following: phosphorus, potassium, sodium, fluorine, or chlorine. Other dangerous chemicals shall be used only in authorized experiments, under close teacher supervision, and in the specified amounts required for immediate use.

7) Pupils in the elementary schools are not permitted to conduct experiments which involve the use of an open flame, including candles or canned heat.

8) Teachers in the elementary schools may conduct approved open flame experiments for viewing by pupils. Candles and canned heat may be used. Butane, propane, and prestolite are prohibited in the elementary school classrooms.

9) The use of dry ice in the elementary school science classes is prohibited.

* * *

2370-51 RADIOACTIVE MATERIAL.

a. General Requirements.

1) Users of Sources of Radiation. Secondary schools and colleges shall conform to the laws and regulations relating to atomic energy development and radiation protection as contained in the California Health and Safety Code; California Penal Code; and California Administrative Code, Title 17. In addition, secondary schools and colleges shall conform to the provisions of this section.

2) Types of Licenses. Licenses for radio-active material are of two types—General and Specific. General licenses are effective without the filing of an application or the issuance of licensing documents to particular persons. An individual teacher working under the provisions of a general license may receive and possess up to the quantities of radioactive materials listed in Schedule B, provided that no teacher shall at any one time possess or use more than a total of ten (10) such quantities.
Specific licenses are required for sources other than those listed on Schedule B or for quantities greater than the ten (10) scheduled quantities permitted by Schedule B, California Administrative Code, Title 17, Radiation. Information regarding specific licenses can be obtained from the Safety and Driver Instruction Section.

3) Radioactive Isotopes. Isotopes approved for use in the schools and colleges under a general license are those listed in Schedule B, except that no unsealed sources of radium are permitted unless authorized by the Science Center.

4) Unit of Measurement. The standard unit of radioactive isotope measurement to be used for inventory and reporting purposes is the microcurie.

b. Procurement of Radioactive Isotopes. Generally Licensed Quantities.

1) Quantity Limitations. No individual teacher shall possess more than ten (10) scheduled quantities as listed in Schedule B at any one time.

2) Requisitions. All orders for radioactive isotopes shall be processed through the Science Center.

3) Other Sources of Procurement. Teachers with a means of procurement of isotopes from sources outside the District, such as AEC coupons or donations, shall also process orders for such material through the Science Center.

4) Receiving Procedures for Radioactive Materials. Upon receipt of radioactive isotopes, the teacher shall:

(a) Inspect the package for breakage.

(b) Monitor the packing material for contamination.

(c) Label or tag each container with standard insignia. Each container of radioactive material in storage shall be labeled to indicate:

(1) That the material is radioactive.

(2) The chemical name of the material or the isotope and its mass number.

(3) The amount or quantity of the radioactive material and the date of measurement.

(4) The date received and the person responsible for the material.

c. Storage of Radioactive Isotopes—Generally Licensed Quantities.

1) Inventory. All schools and colleges in which radioisotopes are stored shall maintain an accurate and current inventory of the quantity of material present. Isotopes shall be removed from inventory when properly disposed of or when seven (7) to ten (10) half-lives have passed since the date of the initial measurement. (See Section (e.) for disposal procedures.)

2) Storage Facilities: Radioactive materials shall be in controlled storage when not in use.

3) Quantities in Storage. No school or college shall store more than ten (10) scheduled quantities as contained in Schedule B in a given classroom or storeroom, taking half-life into account, except as authorized by a specific license.

d. Use of Radioactive Isotopes.

1) Radiation Safety:

(a) Caution Signs and Labels. The radiation symbol prescribed by the California Radiation Control Regulations is not required to be posted in rooms where generally licensed quantities of radio-isotopes are used and stored. However, its use is recommended.

(b) Personnel Monitoring. The use of a dosimeter or film badge is not required for generally licensed quantities. Precautions should be taken to make certain that no radioactive material has come into contact with the skin or has entered the body through the mouth or by breathing. After handling radioactive materials, particularly liquids, the student or teacher shall check his hands and body with a Geiger Counter for traces of radioactivity.

(c) Handling Techniques. No source shall be handled with the fingers. Suggested handling techniques are: thin rubber gloves for shielding alpha emitters. Beta emitters can be shielded by glass or aluminum. Twelve (12) inch tongs to reduce the exposure dose. The generally licensed gamma sources authorized for use in schools and colleges shall be handled in the same way as beta emitters or with other procedures of comparable safety.

(d) Experiments. Experiments shall be performed in a manner to avoid contamination and to minimize exposure. Experiments shall not be performed where gaseous radioactive products are possible.

2) Precautions in Using Radioactive Materials. (Generally Licensed Quantities)

(a) Maintain "good housekeeping" at all times.

(b) Plastic or rubber gloves shall be worn during each experiment where practicable and hands shall be washed thoroughly after each experiment.

(c) Make all experimental set-ups on easily cleaned trays. Trays should be covered with disposable absorbent paper. Do not use radio-isotopes near unprotected wood, concrete, or brick surfaces.

(d) Keep all active solutions covered.

(e) Clamp all containers holding radioactive substances.

(f) Never pipette by mouth.

(g) Use tongs or tweezers in handling containers and specimens.

(h) Have available an approved paper lined container to hold all solid contaminated waste pending approved disposal. See e. 1 for liquid waste.)

(i) Set up new procedures with "dummy runs" not involving radioactive material.

(j) Never eat or drink in a room in which radioactive materials are used or stored.

(k) Give immediate attention to cleaning up any contamination.

3) General Decontamination Procedures:

(a) Hands and skin—wash thoroughly and repeatedly with mild soap and water.

(b) Clothing—ordinary laundry procedures are usually sufficient.

(c) Glassware, rubber, linoleum, ceramic tile, painted surfaces, metal—wash with detergent and hot water.

(d) Laboratory traps and drains—flush with running water for a minimum of five (5) minutes.

(e) Emergency Procedures. In the event of an emergency involving contamination, contact by telephone the local Los Angeles Office of the Bureau of Radiological Health, State of California Department of Public Health, Madison 0-3030 or other designated agencies. Then notify the Safety and Driver Instruction Section. If no one can be reached at the local Bureau of Radiological Health, contact the State Department of Public Health, 2151 Berkeley Way, Berkeley 4, California, which maintains twenty-four (24) hour seven (7) days a week emergency telephone service.

e. Disposal Procedures (approved generally licensed quantities only)

1) Liquid Radioactive Waste. Liquid waste shall be disposed of in accordance with Section 30287 of the California Radiation Control Regulations.

2) Solid Radioactive Waste. All solid waste of generally licensed material shall be disposed of by transfer to persons holding a specific license for such disposal. Waste disposal shall be coordinated through the Science Center.

f. Application for Specific License.

1) All applications for a specific license shall be in accordance with the requirements specified in the California Radiation Control Regulations.

2) All applications for specific licenses must be signed by the administrator of the school or college or his designated administrative representative.

3) When a specific license is granted, a copy of the license shall be sent to the Science Center by the school or college receiving the license.

4) Schools or colleges which are granted a specific license must have available for the use of all persons involved a copy of the laws and regulations relating to radiation protection as contained in the California Health and Safety Code, California Penal Code, and California Administrative Code.

A handbook containing applicable excerpts from the codes involved is published by the Department of Public Health of the State of California.

5) Conditions for safety established by the Department of Public Health of the State of California in granting a specific license shall be followed.

6) All orders from schools and colleges for radioactive materials shall be processed through the Science Center.

7) Records shall be kept of all radioactive material orders processed through the Science Center including the name of the school or college to which the materials are to be sent.

g. Leak Testing. Leak testing of all sealed sources of quantities greater than those specified in column one (1) of Schedule B shall be performed at intervals not to exceed six months, in accordance with the requirements of the California Radiation Control Regulations.

* * *

2370-129 CAMPING AND OUTINGS

a. First Aid Kits. Playground directors or supervisors shall have a first aid kit in their possession, or immediately available, while conducting a field trip. This shall include a snake-bite kit where danger from snakes exists. (Education Code)

b. Locations. Sites, locations, destinations for camping and outings, including horseback riding, hiking, beach trips, and snow trips, shall, insofar as reasonably possible, be surveyed in advance and be approved by a youth services director, supervisor, or person in charge, if such locations have not already had prior approval.

c. Hiking. The following precautions shall be observed for hiking:

1) Hikes shall be planned so that hikers return to camp before nightfall.

2) Hikers shall wear suitable clothes for hiking.

3) Hike leaders shall carry a compass and be familiar with its proper use.

4) Safety rules for hikers should be reviewed before the first hike on each outing.

d. Horseback Riding. The following precautions shall be observed for horseback riding:

1) Personnel in charge shall be experienced horsemen.

2) Instruction shall be given in proper handling, methods of mounting, dismounting, and guiding.

3) Horses known to be gentle shall be used.

4) Riding equipment shall be checked to insure proper fit and safe condition.

TYPICAL EYE PROTECTION LAW
(Virginia)

The following is the text of a law enacted to require that eye protective devices be used in the schools of Virginia. Similar laws are in effect in other states.

An Act to require certain students and teachers to wear eye protective devices when participating in certain courses.

Approved March 1, 1966

Be it enacted by the General Assembly of Virginia:

1. § 1. Every student and teacher in any school, college, or university participating in any of the following courses:

(A) Vocational or industrial arts shops or laboratories involving experience with:

1. Hot molten metals;
2. Milling, sawing, turning, shaping, cutting, grinding, or stamping of any solid materials;
3. Heat treatment, tempering, or kiln firing of any metal or other materials;
4. Gas or electric arc welding;
5. Repair of any vehicle;
6. Caustic or explosive materials;

(B) Chemical or combined chemical-physical laboratories involving caustic or explosive chemicals or hot liquids or solids; shall be required to wear industrial quality eye protective devices at all times while participating in such courses or laboratories.

The governing board or authority of any public or private school or the governing body of each institution of higher learning shall furnish the eye protective devices prescribed in § 3 hereof free of charge or at cost to the students and teachers of the school participating in the courses set out in § 1 hereof; provided, however, that such devices may be furnished by parents or guardians of such students. Eye protective devices shall be furnished to all visitors to such courses.

§ 3. "Industrial quality eye protective devices," as used in this act, means devices providing side protection and meeting the standards of the American Standards Association Safety Code for Head, Eye, and Respiratory Protection, Z2.1-1959, promulgated by the American Standards Association, Inc.

NSTA STATEMENTS ON CRITICAL ISSUES CONFRONTING THE SCIENCE TEACHING PROFESSION

Prepared by the NSTA Committee on Issues

At its annual meetings in July 1968 and 1969, the board of directors of the National Science Teachers Association adopted the following statements as prepared by the NSTA committee on issues. The issues, in draft form, had been circulated to all NSTA members and were the subject of general open sessions at the NSTA conventions. The statements as given below are now to be considered as official policies and positions of the Association.

1968

The Use of Live Animals in the Science Classroom[1]

Biology, being the study of life, cannot be taught properly without utilizing living plants and animals. The use of living animals in the classroom entails a serious responsibility. Students and teachers are obligated to handle living animals humanely and kindly.

Restrictive legislation—whether a state statute or a school regulation—can impair the educational effectiveness of the classroom teacher and the school science program as well as the development of humane attitudes by students.

The National Science Teachers Association has the highest regard for the judgment of qualified, professionally trained teachers and would leave to that judgment the decisions as to the appropriate use of living animals in the classroom.

We therefore encourage and support science teachers in the proper use of living animals in the classroom. The Association strongly urges teachers, administrators, parents, boards of education, and public officials to nullify restrictive regulations regarding the use of living animals so as to make it possible for science instruction to become a more effective educational experience for students.

The Teaching of Human Reproduction

Although few concerns are as fundamental to the affairs of man as human reproduction, the teaching of this subject continues to be discouraged or actually prohibited in many educational systems. Even without explicit restrictions, moreover, many teachers still must contend with an implied possibility of administrative or community censure. The National Science Teachers Association therefore issues the following statement of policy.

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[1] Teachers seeking guidance in the proper care and use of live animals may find the following references useful: *Guide for Laboratory Animal Facilities and Care.* Public Health Service, U.S. Department of Health, Education, and Welfare. Revised 1965. 45 pp. "Guiding Principles in the Use of Animals by Secondary School Students and Science Club Members." National Academy of Sciences, Washington, D.C. 1968. "New Animal Legislation." *The Science Teacher* 33: 26; November 1966.

1. We are concerned primarily with the biological aspects of human reproduction, which are most often clearly distinct from social or moral issues. Without intending to prescribe or limit, we identify the following topics as being properly part of the biological subject matter of human reproduction.

genetic and endocrine foundations of sexuality
anatomy and physiology of male and female reproductive systems
nature and development of secondary sex characteristics
puberty, menopause, and other sex-related phenomena of the life cycle
sperm and egg maturation, including menstrual cycles
mating, fertilization, and the events of pregnancy
development of embryo and fetus, including polyembryony
birth, lactation, and postnatal development
relation of reproduction to population biology and the ecology of man
reproductive hygiene and the principal reproductive diseases

2. We regard instruction in the biology of human reproduction to be essential in the education of every person and to represent a legitimate component of any teaching program in the life sciences. We hold that education in this field is feasible at every curricular stage and can therefore begin at the earliest grade or age level.

3. The appropriately qualified teacher is trained to provide instruction in the biology of human reproduction. Therefore he should be free from external restrictions, implied or expressed, that cannot be justified on strictly biological or scientific grounds. We strongly support and encourage all efforts, including particularly those of school boards and school administrators, that aid and facilitate this free exercise of the teacher's educational function.

The Liability of Teachers for Laboratory Safety and Field Trips

The National Science Teachers Association maintains that experimentation and field trips are essential in science education. However, in some states teachers have personal legal liability for accidents in the classroom and on field trips. Understandably, many teachers are therefore reluctant to have their pupils engage in experimental work or participate in field trips, even though they are exercising all due precautions.

Any obstacle that tends to prevent teachers from utilizing these important components of science instruction must be removed. The Association takes the position that teachers employed to give science instruction are acting as agents of the boards of education and, therefore, should be spared personal liability for accidents that may happen to pupils while in their charge in the course of laboratory and field studies.

The Association urges strongly that liability be borne by the institutions involved and not by teachers personally. Science teachers must be spared the responsibility of personal liability through state legislation where necessary. They would thus be encouraged to take advantage of laboratory exercises and field trips.

1969

Instruction in Human Sexuality

An understanding of human sexuality as a fundamental and natural characteristic of man is essential for an appreciation of the forces that affect the attitudes and actions of individuals, families, communities, and nations.

Schools have long been involved in sex education but frequently without consideration of the full range of human sexuality. Schools should correct this omission by establishing positive educational programs, kindergarten through grade 12. Sex education should involve the physical, emotional, mental, social, and moral dimensions of sexuality. It is especially important that education in sexuality be related to the maturation of students and a sensitive program of this nature must be conducted by teachers qualified to do so by both training and temperament.

THE POLITICAL POWER YOU HOLD

(This is the text of a pamphlet published by the NEA Division of Legislation and Federal Relations, 1201 16th St., N.W., Washington, D.C. 20036. Reprinted with permission.)

The Constitutional rights of the American citizen offer him a base of political power which has few, if any, precedents in history. Through individual and collective action, he is able to exert considerable influence on the course of local, state, and national legislation.

In fact, reports Sen. Lee Metcalf (D-Mont.): "Laws have been passed or killed on the basis of a single well-written letter."

How can the private citizen exercise his political influence most effectively? Teachers are citizens and as such should do more than vote. As teachers they have responsibility for leadership and are expected as educated persons to hold informed opinions. They should, therefore, take part in civic processes which nominate candidates, formulate platforms, and influence state and national policies.

Political Action Line

There are several direct ways for the individual educator to exercise his political power.

The local education association is one vital means by which teachers can inform themselves. Through the local association they can arrive at common decisions regarding the need for improving the educational opportunity for all children, regardless of where they live. As teachers help others to make similar decisions, they contribute to the national welfare.

The teaching profession, then, must accept a major responsibility for informing its members on the educational implications of political issues. It must lay before the general public the facts of the educational situation, and share the insights into educational policy which the average citizen does not have. It must encourage favorable legislation in state and national capitals.

Teamwork Counts

Within the nation, the National Education Association serves as a source of information and a channel through which teachers can make themselves heard.

Within the state, the state education association guides and supports the efforts of teachers in the fundamental function of state government—education.

Within the community, the local association can effectively inform individuals, helping opinion to emerge from the grass roots. It can then communicate this opinion as a group and as individuals to legislators and the local public.

Be Informed

The key to successful political activity is information. There are things you will need to know before organizing any kind of program:

A. *Geographical*

A map large enough to show the boundaries of your district, and a description of the district in terms of other political entities (counties, state assembly or senatorial districts, or congressional districts).

B. *Sociological*

Population figures; racial and ethnic composition; population growth and patterns.

C. *Organizational*

Civic and fraternal groups (with information on their relative power, leaders' names, and past positions on major issues); newspapers, TV and radio stations serving the district, with names of contacts in each; labor unions, their relative strengths, and names of the leadership; and an assessment of the local 'power structure' and who gets things done.

D. *Educational*

School districts, higher education institutions, local associations, affiliate groups, local legislative committee representatives.

E. *Political*

A map showing precinct lines; registration totals of political parties by precinct; voting records showing votes by precinct as far back as possible; list of party officials and office holders and their stands on major issues; and lists of volunteer political clubs and citizens committees.

Build Your Strategy

Legislation results from the conflict of interests. In the Congress these are varied, and many are highly vocal. The forces of good education must carry out a vigorous campaign.

Although the resolutions of the NEA and state education associations concerning federal aid are well known in Congress, those adopted by local associations can be extremely effective. The activity of drafting, discussing, passing, and publicizing the resolution informs the members. The resolution informs the congressman that his own constituents have an opinion and recognize his involvement with passage of the legislation.

Armed with information and resolutions, the local association, through its legislative committee, can start identifying friends in the community leadership who will lend support to legislation. Public opinion, actually, is the sum of many opinions. Encouraged by educators, many individuals will combine their voices for better schools.

When Congress is not in session, the individual member is back home, visible, approachable, and eager to meet his voters. This is a good time to meet him and discuss the issues.

In legislation, no victory is certain and no loss assured until a bill is signed or the closing gavel of the session falls. Therefore, the local association should allow for continuous promotion of its program and plan for emergency action. Strategies should be developed for organized letter writing, the collection and distribution of materials, and communication to the community.

When you visit Washington, you can make important visits with your congressmen and senators. Call at their offices on Capitol Hill. Talk personally with them and with their staff. If the Congress is in session, ask for a pass to the House or Senate Visitors' Gallery.

The NEA Division of Federal Relations will arrange appointments on Capitol Hill for you if you wish. This division will also appreciate any report you wish to make on your visit.

Don't Forget to Write

While the chairman of the legislative committee may have the official responsibility for keeping the congressmen and senators informed of the viewpoint of the local association, many members of the association should fulfill their citizenship responsibility in this respect.

Letters to congressmen should be brief, not more than one page, friendly, and personal. They should come to the point, solicit the congressman's support, state reasons why he should give it, and request a reply.

Timing is important: keep in mind that premature attempts to get a legislator to take a stand on a particular bill may be damaging. Give him a chance to get acquainted with it. He is then more apt to respond to the point of view of the teaching profession.

Following are a few do's and don'ts in writing to congressmen. Observing them will pay off.

Please do . . .

Spell names correctly

Write on plain or personal stationery

Be informed, concise, factual, sincere

Identify the issue, relate it locally

Follow through, as needed, and be sure to write a thank-you note.

Please don't . . .

Misspell names, guess at facts, or base letters on rumor

Use school paper or incorrect language

Scold, threaten, or flatter

Write in generalities

Use form letters or copy another person's letter

GUIDING PRINCIPLES IN THE USE OF ANIMALS BY SECONDARY SCHOOL STUDENTS AND SCIENCE CLUB MEMBERS

(These principles were adopted in 1969 by the National Society for Medical Research, 1330 Massachusetts Ave., Washington, D.C. 20005. Reprinted with permission.)

1. The basic aims of experiments involving animals are to achieve an understanding of life processes and to further man's knowledge. The development of the scientific method can be enhanced when teachers and science fair judges insist that experiments involving animals have clearly defined objectives requiring the use of animals to demonstrate a biological principle or answer scientific propositions. Such experiments *must* be conducted with a respect for life and an appreciation of humane considerations that must be afforded all animals.

2. Protista and other invertebrates are preferable for most experiments involving animals. Their wide variety and the feasibility of using larger numbers than is usually possible with vertebrates makes them especially suitable.

3. To provide for humane treatment of animals, a qualified adult supervisor who has had training in the proper care of laboratory animals *must* assume primary responsibility for the conditions of any experiment that involves living vertebrates. If the school faculty includes no one with training in the proper care of laboratory animals, the services of such a person on a consulting basis *must* be obtained.

4. No experiment may be undertaken that involves anesthetic drugs, organisms pathogenic for man or other vertebrates, ionizing radiation, carcinogens, or surgical procedures other than venipuncture or hypodermic injection, unless these procedures are performed under the immediate supervision of a biomedical scientist experienced in the field under investigation.

5. The comfort of the animal used in any experiment shall be a prime concern. No experiment using live animals shall be attempted unless the animals shall have been obtained from a reliable source and the following conditions can be assured: appropriate, comfortable quarters; adequate food and water; humane treatment and gentle handling. Proper quarters and care must be provided at all times, including weekends and vacation periods. An experiment in nutritional deficiency may proceed only to the point where symptoms of the deficiency appear. Appropriate measures shall then be taken to correct the deficiency, if such action is feasible, or the animal(s) shall be killed by a humane method.

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